

✓  
alists  
5B  
599  
R38  
Vol. 54 Ser. A Title-page and Index

[Issued 1971]

# THE REVIEW OF APPLIED ENTOMOLOGY

U. of ILL. LIBRARY

SEP 27 1971

SERIES A: AGRICULTURAL CHICAGO CIRCLE

ISSUED BY THE COMMONWEALTH  
INSTITUTE OF ENTOMOLOGY



LONDON:  
COMMONWEALTH INSTITUTE OF ENTOMOLOGY,  
56, QUEEN'S GATE, S.W.7

Prepared and issued by the Commonwealth Institute of Entomology under the authority of the Executive Council of the Commonwealth Agricultural Bureaux.

© Commonwealth Agricultural Bureaux, 1971

All rights reserved. No part of this publication may be reproduced, in any form or by any means, electronically, mechanically, by photocopying, recording or otherwise, without the prior permission of the copyright owner.

# Commonwealth Agricultural Bureaux

## EXECUTIVE COUNCIL

V. ARMSTRONG, Ph.D., *Chairman*

E. S. KAPOTWE, *Vice-Chairman*

*To be nominated*

J. L. ORR

E. G. HALLSWORTH, D.Sc.

A. J. KIDWAI

T. A. KHAN

A. NESARATNAM

J. A. BROBBEY

Mrs. Z. ZULKIFLI

U. K. BELLO

*To be nominated*

H.E. THE HIGH COMMISSIONER

*To be nominated*

THE DEPUTY HIGH COMMISSIONER

Mrs. L. S. DORSET

*To be nominated*

H.E. THE HIGH COMMISSIONER

W. D. SIMFUKWE

O. A. SALLAH

B. R. S. HAYNES

H.E. THE HIGH COMMISSIONER

THE DEPUTY HIGH COMMISSIONER

G. FACKNATH

E. E. KUNENE

D. M. KITCHING

Dr. R. GLEN, Secretary, Commonwealth Scientific Committee (*Observer*)

Sir THOMAS SCRIVENOR, C.M.G., *Secretary*

N. G. JONES, D.F.C., *Assistant Secretary*

New Zealand

Zambia

United Kingdom

Canada

Australia

India

Pakistan

Ceylon

Ghana

Malaysia

Nigeria

Cyprus

Sierra Leone

Tanzania

Jamaica

Trinidad and Tobago

Uganda

Kenya

Malawi

The Gambia

Guyana

Botswana

Barbados

Mauritius

Swaziland

Dependent Territories

Farnham House, Farnham Royal,  
Slough SL2 3BN

## COMMONWEALTH INSTITUTE OF ENTOMOLOGY

### Director and Editor

R. G. FENNAH, M.A., Sc.D.

### Assistant Director

A. H. PARKER, M.Sc., Ph.D.

### Assistant Editors

R. F. AVERY, M.A.

*Headquarters, Publication Office and Library*—56, Queen's Gate, London SW7 5JR,  
England

*Identification Service*—c/o British Museum (Natural History), Cromwell Road,  
London SW7 5BD, England



# GENERAL INDEX

Chemical compounds having numerical prefixes (bis-, di-, etc.) are indexed under these prefixes, but the prefixes o-, m- and p- (ortho-, meta- and para-), O-, N-, P- and S- to indicate positions of radicals, and normal, secondary and tertiary are ignored for alphabetisation.

## A

- Abberia caffra*, *Ceratitis capitata* on, in Tunisia, 244
- Abgrallaspis cyanophylli*, new records of, on ornamental plants in Bulgaria, 557
- Abies*, *Megastigmus strobilobius* infesting cones of, in Soviet Union, 437
- Abies alba*, *Adelges prelli* on, 124; *Platypus oxyurus* attacking recently cut wood of, in Spain, 255; *Choristoneura murinana* on, in Germany, 379; Lepidoptera on, in Czechoslovakia, 517; *Choristoneura murinana* on, in Germany, 563; structure of stands of, affecting outbreaks of *Choristoneura murinana* in Czechoslovakia, 631; *Adelges* spp. on, in Czechoslovakia, 632
- Abies balsamea*, in diet for *Choristoneura fumiferana*, 23; parasitism of *Choristoneura fumiferana* on, in Quebec, 152; damage by *Choristoneura fumiferana* to, in Quebec, 201; fungous deterioration of, killed by *Choristoneura fumiferana* in Canada, 309; *Adelges piceae* on, in Magdalen Islands, 502; parasitism of *Choristoneura fumiferana* on, in Maine, 646
- Abies concolor*, *Scolytus ventralis* on, in California, 170
- Abies fraseri*, *Adelges piceae* on, in North Carolina, 485
- Abies lasiocarpa*, *Choristoneura fumiferana* on, in British Columbia, 18
- Abies nordmanniana*, *Adelges prelli* on, 124
- Abutilon theophrasti*, *Trialeurodes abutilonea* on, in Illinois, 304
- Ac43064 (see 2-(Diethoxyphosphinothioylimino)-1,3-dithiolane)
- Acacia*, *Psylla uncatoides* on, in California, 180
- Acacia*, Yellow (see *Caragana arborescens*)
- Acacia cyanophylla*, damaged by *Phoracantha semipunctata* in Tunisia, 245
- Acacia karoo*, *Casama innotata* on, in Libya, 51
- Acalymma vittatum*, varietal resistance of cucurbits to, in Kansas, 343
- Acalypha*, *Adoretus sinicus* on, in Hawaii, 174
- Acandotheca* (see *Tephromyrella*)
- Acanthiophilus helianthi*, damaging *Carthamus tinctorius* in Israel, 636
- Acanthocinus*, abundance of, in relation to *Myelophilus piniperda* in Finland, 383, 384
- Acanthoderes clavipes*, infesting elms in Soviet Union, 143
- Acanthomia horrida*, aerial sprays against, attacking beans in Tanganyika, 394, 530
- Acanthopsyche tristoides* sp.n., on cacao in Ghana and Nigeria, 403
- Acanthoscelides obtectus*, effect of  $\gamma$ -radiation on, 58; infesting stored and field beans in Poland, 139; influence of sex ratio on populations of, in dried beans, 573
- Acaphylla indae*, infesting tea in India, 663
- Acaphylla steinwedeni* (see *Acaphylla theae*)
- Acaphylla theae*, on camellia in Florida, 543-545; infesting tea in India, 663
- Acarina, Tetranychidae of Arizona, 343
- Acarology, papers dealing with, 196
- Acarus farris*, nutrition affecting hypopus formation in, 504
- Acarus immobilis*, nutrition affecting hypopus formation in, 504
- Acarus siro*, use of *Cheyletus eruditus* against, in stored grain in Czechoslovakia, 200-201; moisture gains and losses in, 290; limits of temperature and humidity for development of, in stored grains, 466, 467; nutrition affecting hypopus formation in, 504; effects of  $\gamma$ -radiation on, 591
- Acer pseudoplatanus*, chemical decomposition of, by termites, 406
- Aceria*, sprays against, on vines in Soviet Union, 509
- Aceria camelliae*, on camellia in Florida, 543-545
- Aceria carvi*, damaging caraway in Czechoslovakia, 631
- Aceria erinea*, on plants in Poland, 633
- Aceria hippocastani*, fungus disease of, on *Aesculus hippocastanum* in England, 49
- Aceria litchii*, bionomics of, attacking litchi in East Pakistan, 145
- Aceria medicaginis*, virosis-like proliferation of lucerne caused by, in Australia, 223
- Aceria neocynodonis*, on *Cynodon dactylon* in Florida, 543-545
- Aceria sheldoni*, bionomics and control of, on *Citrus* in Portugal, 386; on *Citrus* in Florida, 543-545
- Aceria tulipae*, on wheat in Arkansas, 159
- Acetic Acid, in rearing medium for *Spodoptera littoralis*, 104
- Acetone, use of, to obtain extracts from plants treated with insecticides, 137; *Drosophila melanogaster* not responding to, 289; as solvent for sex attractant of *Pectinophora*



- gossypiella*, 500; use of, in extractions of rice bran, 548
- d*-12-Acetoxy-*cis*-9-octadecen-1-ol, against *Lymantria* spp., 656
- Acetyl Thiocholine, attractiveness of, to *Eurytoma roddi*, 57
- Acetylene Burners, against *Oryctes rhinoceros*, 313
- Achaea janata*, BHC dust and *Bacillus thuringiensis* against, on castor in India, 318
- Achaetoneura*, *Epantheria icasia* parasitised by, in Costa Rica, 645-646
- Achatina fulica*, introduced enemies of, in Hawaii, 174
- Acherontia atropos*, as enemy of hive bees in Rhodesia, 394, 395
- Acheta campestris*, diapause of, 622
- Acheta domesticus*, penetration and metabolism of H<sup>3</sup>-dimethoate in, 27; effects of carbon-dioxide anaesthesia on, 65; as textile pest, 125; role of lipid in nutrition of, 179; records of, infesting textiles in Germany, 521, 522; parasitised by DD-136 (nematode), 541; ether extract of, inhibiting growth of *Gryllobes sigillatus*, 605
- Achras zapota*, *Anarsia* sp. on, in India, 664
- Achroia grisella*, as enemy of hive bees in Rhodesia, 394, 395; susceptibility of, to *Bacillus thuringiensis*, 430
- Achrysocharella ruforum*, parasitising *Neodiprion sertifer* on pine in Czechoslovakia, 200
- Achrysophagus aegyptiacus*, parasitising *Chilocorus* larvae in Israel, 390, 391
- Acidia* (see *Euleia*)
- Acinocoris bilineatus*, on rice in British Guiana, 171
- Acinopus laevigatus*, on cereals in Soviet Union, 17
- Acinopus picipes*, on cereals in Soviet Union, 17
- Aconitic Acid, repellent to *Eurytoma roddi*, 57
- Acorns (see Oak)
- Acorus calamus*, toxicity of extracts of, to insects, 86; toxicity of, to adults of *Dacus cucurbitae*, 316
- Acricid (see Binapacryl)
- Acridology, handbook of, 184
- Acrobasis caryae*, sprays against, on pecan in Florida, 209-210
- Acrobasis tricolorella*, damage to sour cherry by, in Wisconsin, 270
- Acrobasis vaccinii*, sex ratio and mating history of trapped adults of, in Massachusetts, 583
- Acrocarpus fraxinifolius*, attack on, by *Coptotermes* in Uganda, 443, 444
- Acrocercops cramerella*, insecticides against, on cacao in Philippines, 481
- Acrolepia assectella*, *Diadromus* sp. parasitic in, on leeks, 182-183
- Acronicta* (see *Apatete*)
- Acrotheca caulium*, infection of *Orthezia praelonga* by, in Brazil, 461
- Actia diffidens*, parasitising *Archips cerasivoranus* in Minnesota, 642-643
- Actia interrupta*, parasitising *Choristoneura fumiferana* on *Abies balsamea* in Quebec, 152
- Acti-dione, treatment of soil with, 28
- Actinomycin D, effects of, on reproduction of *Myzus persicae*, 496
- Actinophora fragrans*, *Amphithales episcopopa* and associated fungi on, in Java, 178
- Actinote pellenae pellenae*, damaging sunflower in Argentina, 287
- Aculus pelekassi*, on *Citrus* in Italy, distinguished from *Phyllocoptruta oleivora*, 331; on *Citrus* in Florida, 543-545
- Aculus schlechtendali*, on plants in Poland, 633
- Acyrtosiphon* (see *Macrosiphum*)
- Adactylidium*, bionomics of, preying on eggs of *Gynaikothrips ficorum* in Egypt, 538
- Adalia angulifera*, as enemy of mites in Chile, 48
- Adalia bipunctata*, natural enemies of, 104; preying on *Ostrinia nubilalis* on maize in United States, 275; toxicity of insecticide sprays to, in Britain, 471; suitability of aphids as food for, in Britain, 506, 507; host-specificity and micro-distribution of, attacking aphids in France, 559-560; effect of aphid host on reproduction of, 598
- Adalia decempunctata*, natural enemies of, 104; host-specificity and micro-distribution of, attacking aphids in France, 559-560
- Adalia deficiens*, as enemy of mites in Chile, 48
- Adelges merkeri*, *A. prelli* distinguishable from, 124; on silver fir in Czechoslovakia, 632
- Adelges nordmannianae*, *A. prelli* distinguishable from, 124; insecticides against, infesting silver fir in Czechoslovakia, 632
- Adelges nuesslii* (see *A. nordmanniana*)
- Adelges piceae*, *Aphidecta oblitterata* predacious on, (on *Abies*) in North Carolina, 485; origin of infestations of, in North Carolina, 485; preyed on by *Leucopis* spp., infesting balsam fir on Magdalen Islands, 502; on silver fir in Czechoslovakia, 632
- Adelges prelli*, phenotypes of, 124
- Adelges typica*, on silver fir in Czechoslovakia, 632
- Adelina tribolii*, infectivity of, for insects, 427
- Adelpherupa*, in Africa, 481, 482
- Adelphocoris fasciaticollis*, on cotton in China, 88
- Adelphocoris lineolatus*, on cotton in China, 88; development of *Leiophron pallipes* in, in Ontario, 351
- Adelphocoris rapidus*, migration studies of, 42; light-traps for, 42; development of *Leiophron pallipes* in, in Ontario, 351
- Adelphocoris ticinensis suturalis*, on cotton in China, 88
- Adenophora verticillata*, *Lasioderma serricorne* recovered from medicinal roots of, 422, 423
- Adenosine-5'-triphosphate, attractiveness of, to *Anthonomus grandis*, 281
- Adhatoda vasica*, insecticidal property of powdered leaves of, against pests of storage in India, 216
- Adhesive Traps, use of, for monitoring activities of *Rhagoletis pomonella*, 24; aphids captured by, 261; with hydrolysed-protein baits, for *Rhagoletis pomonella*, 352; for *Empoasca fabae*, 582
- Adhesives, for seed coating reducing germination in swede and turnip, 344
- Adonia variegata*, natural enemies of, 104; host-specificity and micro-distribution of, as predator of aphids in France, 559-560



- Adonia* (see also *Semiadalia*)  
*Adoretus sinicus*, bionomics of, in Hawaii, 174  
*Adoxophyes orana*, viruses pathogenic to, 122; sprays against, not affecting *Typhlodromus pyri* on apple in Holland, 122; on apple in Poland, 453, 454; nuclear polyhedrosis viruses of, 526; photoperiodic responses in two populations of, in Japan, 547-548; rearing of, on artificial food, 571; forecasting oviposition and hatching of, for control operations in Holland, 654  
*Adoxophyes reticulana* (see *Adoxophyes orana*)  
*Adris tyrannus amurensis*, orchard illumination against, in Japan, 148  
*Aechmea fasciata*, effect of soil moisture on population development of *Rhizoeus cacticans* on roots of, in Belgium, 576  
*Aedes aegypti*, use of, in bioassay of insecticides, 83; bioassay of pyrethrum with, 113; bioassay of insecticide residues on plant parts with, 137  
*Aegeria* (see also *Trochilium*)  
*Aegeria exitiosa*, resistance of peach trees to, in Ontario, 267-268  
*Aegeria myopaeformis*, bionomics of, on apple in Soviet Union, and insecticides against, 90  
*Aegeria pictipes*, number of generations of, on peach in Ontario, 353; insecticides against, on peach in Virginia, 590  
*Aegeria tipuliformis*, bionomics and control of, on black currant in Germany, 520  
*Aelia*, *Asolcus semistriatus* parasitising eggs of, in Soviet Union, 189; on wheat in Bulgaria, 554  
*Aelia acuminata*, in Middle East, 233  
*Aelia furcula*, in Middle East, 233  
*Aelia melanota*, wind and migration of, in Middle East, 233  
*Aelia rostrata*, wind and migration of, in Middle East, 233  
*Aelia virgata*, *Asolcus rufiventris* parasitising eggs of, in Soviet Union, 189  
*Aeolothrips intermedius*, as predator of thrips in Holland, 341  
*Aerobacter aerogenes*, infecting *Pieris brassicae* in laboratory, 108  
*Aeroglyphus robustus*, infesting stored grain in Canada, 495  
Aerosols, treatment of mushroom-houses with insecticides in, 81  
*Aesculus hippocastanum*, *Aceria hippocastani* on, in England, 49  
*Aethina tumida*, attacking hive bees in Rhodesia, 394, 395  
Afghanistan, *Schistocerca gregaria* in, 16  
Africa, biological control of *Oryctes monoceros* in, 295; *Locusta migratoria migratorioides* in, 400, 401; control of termites in, 443; *Antestiopsis* and *Antestia* on coffee in, 447; termites in, 476; rice stem borers in, 481, 482; *Stenocoris southwoodi* and *Stenocoris apicalis* in, 527; Criocerids damaging *Pennisetum* spp., in, 606  
Africa, East, *Nephotettix apicalis* in, 87; *Oryzaephilus gibbosus* sp.n. found in cargo of coconut from, 295; control of termites in, 443; Lamiids attacking forest trees in, 444; protection of timber from marine borers in, 444, 445; migration of *Spodoptera exempta* in, 529; *Schistocerca gregaria* in, 597  
Africa, North, *Habrolepis fanari* sp.n. parasitising *Chrysomphalus ficus* in, 462  
Africa, South, pests of stored sorghum in, 82; *Nephotettix apicalis* in, 87; lists of insects and their natural enemies in, 110; biological control of *Lantana camara* in, 129; predators of *Aonidiella aurantii* and *Coccus hesperidum* in, 129; *Aphytis* spp. attacking Coccids in, 130; *Ceratitidis* spp. on guavas as source of infestation for *Citrus* in, 129-130; potato aphids and leaf roll spread in, 130-131; *Megalyra fasciipennis* associated with *Phoracantha* spp. in, 131; *Sitotroga cerealella* in, 131-132; toxicity of insecticides to *Pauridia peregrina* in, 132; *Hakea* spp. in, 314; *Toxoptera citricida* in, 338; *Epichorista ionephela* in, 345; host-finding by *Aphytis* spp. in, 395; biology of *Aphytis lingnanensis* on Coccid hosts in, 395; *Trinervitermes trinervoides* in, 395; *Locustana pardalina* in, 396; *Toxoptera citricida* and *Trioza erythrae* on *Citrus* in, insect-transmissible virus of *Citrus* in, 396; *Pulvinaria saccharia* sp.n. on sugar-cane in, 403; vamidothion controlling *Eriosoma lanigerum* on apple in, 532; parasites of honey bees in, 534  
Africa, West, Lepidoptera associated with cocoa in, 620  
*Agallia constricta*, on lucerne in Illinois, 70; on *Trifolium incarnatum* in New York, 70; infection of, with virus, 70, 71; plant virus multiplication in, 115; alimentary canal of, 541; cross reactivity between plant virus transmitted by, and reoviruses, 573-574  
Agar, in diets for insects, 34; effectiveness of suspensions of polyhedra not increased by, 43; in rearing medium for *Spodoptera littoralis*, 104; in diet for *Ips calligraphus*, 209; in diet for *Diatraea saccharalis*, 268; effectiveness of, in rearing medium for *Medetera aldrichii*, 412  
*Agathis*, parasitic in *Cydia toreuta*, 596  
*Agathis cingulipes*, parasitising *Tortrix viridana* on oak in Portugal, 295  
*Agathis fortipes*, parasitising *Tortrix viridana* on oak in Portugal, 295  
*Agathis stigmatera*, *Diatraea saccharalis* parasitised by, in British Guiana, 172  
Agave, *Hypopta agavis* on, in Mexico, 409  
*Agelaius phoeniceus phoeniceus*, predacious on *Diatraea saccharalis*, 581  
*Agriaspis fuscicollis*, parasitising *Hyponomeuta padellus malinellus* in Yugoslavia, 392; parasitising *Hyponomeuta padellus malinellus* in Soviet Union, 553  
*Agistemus fleschneri*, bionomics of, on apple in Chile, 47  
*Aglaonema*, *Temnaspidiotus excisus* on, in Florida, 543-545  
*Aglaosoma variegatum*, attacking *Hakea sericea* in New South Wales, 314  
*Agonoxena arguala*, comparative study of, on coconut, 445, 446  
*Agonoxena miniana*, in *Haemolytis*; comparative study of, on coconut, 445, 446



- Agonoxena phoenicia* sp.n., on *Archontophoenix alexandrae* in Queensland, 445, 446
- Agonoxena pyrogramma*, comparative study of, on coconut, 445, 446
- Agria affinis*, parasitism of *Dendrolimus pini* by, in Austria, 562-563; effects of vitamin A and related substances on, 604; effects of new salt mixture for, 604; effects of different food mixtures on, 621
- Agria mamillata*, as predator on *Hyponomeuta padellus malinellus* in Yugoslavia, 392; in Soviet Union, 553
- Agria mamillata pacifica*, as predator on *Hyponomeuta* larvae in Soviet Union, 322
- Agrilus aurichalceus*, on raspberry in Yugoslavia, 569
- Agrilus viridis*, effect of osmotic pressure of tree sap on development of, in Germany, 576-577
- Agriotes*, treatments against, in Rumania, 90
- Agriotes ferrugineipennis*, sex attractants in extracts of unfertilized females of, 204-205
- Agriotes lineatus*, factors affecting efficiency of insecticides against, on maize in Rumania, 461, 462
- Agriotes mancus*, damaging potato in Quebec, 157
- Agriotes ustulatus*, factors affecting efficiency of insecticides against, on maize in Rumania, 461, 462
- Agriophila straminella*, infestation and control of, on cereal crops in Britain, 230-231
- Agrothereutes adustus*, as parasite of *Diprion pini*, 106
- Agrothereutes lophyri*, as parasite of *Neodiprion pratti pratti* in Virginia, 34
- Agrotis exclamationsis*, parasitised by *Bonnetia comta* in China, 220; analysis of light-trap catches of, in Austria, 654-655
- Agrotis ipsilon*, bionomics of, in Israel, 101; rearing of, 104; parasitised by *Bonnetia comta* in China, 220; eradication of *Cirsium setosum* in control of, on maize in China, 264; insecticides against, 264; method for testing insecticides against larvae of, on maize, 370; attack on, by *Apanteles bourquini* in Chile, 377, 378
- Agrotis orthogonia*, interrelations of damage to wheat and feeding by, in Alberta, 153; sprays against, on wheat in Alberta, 590; measuring food consumption of, with  $^{14}\text{C}$ -labelled compounds, 620
- Agrotis segetum*, effect of temperature on population and distribution of, 15; in Soviet Union, 15; granulosis virus disease of, 16; on maize, potato, sugar-beet, cotton, and tobacco, 16; parasitised by *Bonnetia comta* in China, 220; insecticides against, 264; infection of, with two viruses in Soviet Union, 431; on beet in Iran, 519
- Agrotis spinifera*, in India, 86
- Agromyza morivora*, bionomics of, on mulberry in Japan, 87
- Agropyrum repens*, *Haplodiplosis equestris* on, in Germany, 100; *Agriophila straminella* on, attacking lucerne and cereals in Britain, 231; *Thymelicus lineola* on, in Ontario, 350; *Haplodiplosis equestris* on, in Germany, 380, 381, 565
- Ahasverus advena*, infesting stored groundnuts in Nigeria, 110; attacking stored sunflower seeds in Yugoslavia, 602
- Aiolocaria hexaspilota*, predacious on stages of *Gastrolina thoracica* in Soviet Union, 11
- Aiolopus rodericensis*, in Mauritius and Réunion, 111
- Aiolopus thalassinus*, in Mauritius, 111
- Air (see Atmosphere)
- Aircraft, marking of *Anthonomus grandis* with paint applied from, 46; DDT applied from, 142; portable sprayer for application by, 161; application of insecticides by, 171; application of DDT by, 200; application of insecticides by, 212; application of insecticides by, 239; use of, in plant protection, 239; spray distribution on cotton from, 334; use of, for applying insecticides, 363, 379; 394; dispersal of *Borrelinavirus* by, 432; comparison of, with tractor, for applying insecticides, 474; use of, in estimating adult populations of *Nomadacris septemfasciata*, 531; application of insecticidal dusts by, 549-550; ultra-low volume spraying with, 591
- Akar 338 (see Chlorobenzilate)
- Alabama, thrips on cotton in, 165; pests of cotton in, 166; *Psara ipomoealis* on sweet potato in, 209; species of Plusiinae on field crops in, 498; *Sathrobrotia rileyi* and other pests of maize in, 588
- Alabama argillacea, on cotton in Texas, 30; light-trap catches of, 30; control of, on cotton in Brazil, 243; comparative preference of, for glanded and glandless cottons in Mississippi, 360
- $\beta$ -Alanine, attractiveness of, to *Eurytoma roddi*, 51
- Alaska, pests of *Picea glauca* in, 21
- Alberta, *Sitona cylindricollis* on *Melilotus* in, 40; *Agrotis orthogonia* on wheat in, 153; *Pachygonatopus minimus* as parasite of *Macrostes fascifrons* in, 156; early cutting of wheat and survival of *Cephus cinctus* in, 534-535; reaction to *Cephus cinctus* and stem solidness in spring wheat in, 535; schizogregarine infection in *Melanoplus* spp. in, 572; *Agrotis orthogonia* on wheat in, 590; *Caloptilia syringella* infesting lilac in, 649-650
- Albiza, *Psylla uncatoides* on, in California, 180; *Sternocera aequisignata aurosignata* on, in India, 663
- Albizia julibrissin*, *Homadaula albizziae* on, in Florida, 543-545
- Albizia procera*, mites on, in India, 663
- Albolineum no. 1, increasing effectiveness of parathion, 263
- Alcidodes haemopterus*, damaging cotton in the Sudan, 474, 476
- Alder, *Melasoma* spp. on, in Florida, 543-545; Alder, Green (see *Alnus viridis*)
- Aldrex (see Aldrin)
- Aldrin, against *Oberea oculata*, 6; against *Graphognathus leucoloma fecundus*, 32; persistence of, in soil, 32; against *Hylemya brassicae*, 36; toxicity of, to *Procambarus clarkii*, 37; against *Hylemya trichodactyla*, 43; against *Colaspis* sp., 47; resistance of *Distantiella theobroma* to, 72; toxicity of, to



- Spodoptera littoralis*, 84; ineffective in soil treatments against *Nematocerus sulcatus* and *Aperitmetus brunneus*, 134-135; residues of, in plants, 137; soil and seed treatments with dusts of, against rice pests, 140; in sprays and fertiliser mixtures against *Hylemya brassicae*, 157-158; seed treatments with, against *Lissorhoptrus oryzophilus*, 161; toxicity of, to cyclodiene-susceptible and cyclodiene-resistant strains of *Hylemya antiqua*, 163; in sprays against rice pests, 172; seed treatment with, against *Helodytes foveolatus*, 172; against *Elasmopalpus lignosellus*, 206; toxicity of, to *Heterotermes indicola*, 216; toxicity of, to *Tribolium castaneum* and *Sitophilus oryzae*, 217; phytotoxicity of, applied to soil, 231-232; soil treatment with, against *Psila rosae* and *Hylemya brassicae*, 232; determination of residues of, in grape, 240; soil treatment with, in dusts against *Cyrtomenus mirabilis*, 242; in dusts against *Oxycaenus hyalinipennis*, 243; toxicity of, to *Sitophilus oryzae*, 261; toxicity of, to *Tribolium castaneum*, 261; applied to seed furrow against *Atherigona indica*, 262; in sprays against *Cheimophila salicella*, 267; against *Pediasia* spp., 269; contact versus stomach toxicity of, to *Spodoptera littoralis*, 269; topical and soil applications of, against *Eleodes suturalis*, 270; applied to soil in sprays against *Conoderus* spp., 274; soil treatment with, against *Popillia japonica*, 281; residues of, in crop seeds, 281; not affecting *Procambarus clarkii* in irrigated rice fields, 282; in seed-dressings against *Hylemya coarctata*, 294; presence of, in rainwater in England, 298; toxicity of, to adults and larvae of *Dacus cucurbitae*, 316; stomach toxicity of, to hoppers of *Schistocerca gregaria*, 317; in dusts, against *Otiorynchus* spp., 326; in bran baits, dusts and soil treatment, against Tipulid larvae, 329; in granules and soil treatment with, against *Conoderus* sp., and *Lachnosterna cribrosa*, 364; resistance to, in *Diabrotica virgifera*, 368; soil treatments with, not effective against *Thomasiniana theobaldi*, 382; soil treatment with, against *Odontothrips confusus*, 390; effects of soil types on, against *Trinervitermes trinervoides*, 395; effectiveness of, in stored pine sapwood against termites, 408; against resistant strains of *Hylemya brassicae*, 420; resistance to, in *Psila rosae*, 421; alone and with BHC, soil treatments with, tolerance of larvae of *Nemocestes incomptus* and *Sciopithes obscurus* to, 422; in sprays against *Echinocnemus oryzae*, 441; effect of, against cotton pests, on crop yields, 442, 443; soil and seed treatment with; in dusts against termites, 445; factors affecting efficiency of, in soil or seed treatments against crop pests, 461, 462; replanting treatment with, in drenches, sprays or dust, against *Psila rosae*, 469; against termites and *Chilo infuscatellus*, 479; resistance to, in *Diabrotica longicornis*, 486; susceptibility or resistance to, in *Diabrotica longicornis*, 491; resistance to, in *Hylemya brassicae*, 493, 494; repopulation of thrips in areas previously treated with, against *Popillia japonica*, 497; dusting and spraying surface of soil with, against *Con-*
- tarinia medicaginis*, 512, 513; in dusts at planting against yam beetles, 570; in sprays, against *Hypera variabilis*, 570; against *Blaniulus guttulatus*, 577; persistence of, in soil for control of subterranean termites; bioassay of, using *Coptotermes formosanus*, 587; susceptibility of *Limonius dubitans* to, 594; in sprays against pests of cowpea, 605-606; for protection of freshly felled timber in storage against insect borers and subterranean termites, 615; toxicity and persistence of, in tests with stored-product beetles, 622-623; seed treatment with, against *Podagrica* spp., 656
- Alegina loricellae*, attacking *Argyresthia loricella* in New Brunswick, 502
- Aleochara bilineata*, insecticides against *Hylemya brassicae* harmful to, in Belgium, 575
- Aletia oxygala luteopallens*, effects of virus on habits of, on chicory in Quebec, 50
- Aleurocanthus woglumi*, *Eretmocerus serius* and *Prospaltella opulenta* released against, on *Citrus* in Barbados, 172
- Aleurocybotus occidius*, bionomics of, on grasses in U.S.A., 62
- Aleurolobus barodensis*, on sugar-cane in India, 238; insecticides against, on sugar-cane in India, 664
- Aleurotrachelus jelinekii*, bionomics and control of, on ornamental plants in Soviet Union, 510
- Aleyrodes brassicae* (see *A. proletella*)
- Aleyrodes proletella*, varietal variations in resistance of brussels sprouts to, in Britain, 506
- Aleyrodes spiraeoides*, infesting cotton in California, parasites of, 369
- Alfalfa (see Lucerne)
- Algeria, *Phyllognathus silenus* in, 105; *Habrolepis fanari* sp.n. parasitising *Chrysomphalus ficus* in, 462; *Schistocerca gregaria* in, 597; *Euzophera osseatella* in, 611-612
- Aliesterases, in relation to resistance of *Tetranychus telarius* to phosphorus compounds, 117
- Alkyl Quaternary Ammonium Chloride, effects of, on deposits of DDT, 366
- Alkylthiophenyl Methylcarbamates, insecticidal activity of, 373
- Allethrin, toxicity of, to *Tribolium* and *Sitophilus*, 217, 261
- Allodontermes tenax*, infestation and control of, on crops in Tanganyika, 445
- Allothrombium*, preying on *Aradus cinnamomeus* in Czechoslovakia, 454, 455
- Alloxysta*, as hyperparasite of aphids in Holland, 121
- Alloxysta perplexa*, hyperparasitism by, reared from *Rhopalosiphum insertum* on apple in Holland, 121
- p-Allylthiophenyl Methylcarbamate, against *Musca domestica*, 373
- Almond, *Paramyelois transitella* on, in California, 206-207; *Anarsia lineatella* on, in Cyprus, 333; parasites of *Paramyelois transitella* on, in California, 543
- Alnus viridis*, *Hemichroa crocea* on, in Austria, 456
- Alocasia*, *Hepialiscus sordida* on, in Java, 177



- Alodan (see Chlorbicyclen)
- Alopecurus myosuroides*, thrips on, in Holland, 341
- Alopecurus pratensis*, Thysanoptera on, in Germany, 101; thrips on, in Holland, 341
- Alophora*, parasitisation of *Dysdercus* by, 295
- Alphacel, in diet for *Hypera variabilis*, 285
- Alphitobius diaperinus*, effects of  $\gamma$ -radiation on, in Hungary, 324
- Alphitobius laevigatus*, toxicity of insecticides to, 78; use of, in tests with synergists, 114
- Alsophila pometaria*, effects of, cytoplasmic polyhedrosis on, 56; paired larval rearings of *Ennomos subsignarius* with, 540
- Alternaria*, leaf-spot disease caused by, favoured by insecticides, 263
- Alternaria solani*, incidence of, on potato treated against aphids, 577
- Aluminium Phosphide, tests of tablets containing, for fumigation of stored sorghum, 77
- Alvit-55 (see Dieldrin)
- Amara, on cereals in Soviet Union, 17
- Amarantus*, *Hymenia recurvalis* on, in India, 217
- Amblypelta lutescens papuensis*, dieldrin sprays against, attacking rubber trees in Territory of Papua and New Guinea, 480
- Amblyseius*, distinct from *Typhlodromus*, 205; predacious on *Tetranychus cinnabarinus* in Lebanon, 337
- Amblyseius fallacis* (see *Typhlodromus*)
- Amblyseius finlandicus*, on plants in Poland, 633
- Amblyseius hibisci*, influence of pollen and prey density on predation by, in California, 306; effects of artificial foods on reproduction and development of, 411; interactions between *Oligonychus punicae* and, on *Persea indica*, 648
- Amblyseius limonicus*, effects of artificial foods on reproduction and development of, 411
- Amblyseius similis*, photoperiodic reaction of, 293
- Ambrosia Fungus, sporulation of, 149-150; *Xylosandrus* spp. feeding on, 149-150; *Xyleborus monographus* feeding on, 336
- Am. Cyanamid 18706 (see Ethoate-methyl)
- Am. Cyanamid Compound 24055 (see 1,1-Dimethyl-3-(p-acetamidophenyl)triazene)
- Am. Cyanamid 43064 (see 2-[diethoxyphosphinothiolymino]-1,3-dithiolane)
- Am. Cyanamid [CL]-J47031 (see 2-(Diethoxyphosphinylimino)-1,3-dithiolane)
- Am. Cyanamid 47300 (see Fenitrothion)
- Am. Cyanamid [CL]-J47470 (see 2-(Diethoxyphosphinylimino)-4-methyl-1,3-dithiolane)
- Am. Cyanamid 47772 (see 2-(Dimethoxyphosphinylimino)-4-methyl-1,3-dithiolane)
- Am. Cyanamid [CL]-J52160 (see O,O,O',O'-Tetramethyl O,O'-Thiodi-p-phenylene Phosphorothioate)
- America, Central, research on chemosterilants for control of insect pests in, 296; *Bemisia tabaci* on cotton and other plants in, 401
- America, North, *Ips* spp. in, 153, 205; parasites of Scolytids in, 309; rice stem borers in, 481, 482; vectors of *Ceratocystis ulmi* causing Dutch elm disease in, 502; subgenera, complexes and species of genus *Pogonomyrmex* in, 571
- America, South, *Actinote pellenae pellenae* in, 287; rice stem borers in, 481, 482; palm insects in, 577
- 2,4-D Amine, effect of, on populations of aphids and Coccinellids in oat fields treated with, 424
- Amino Acids, Aromatic, metabolism of, in insects, 297
- 5-Amino-1-bis(dimethylamido)phosphoryl-3-phenyl-1,2,4-triazole (see Triamiphos)
- 5-Amino-1-(bisdimethylaminophosphinyl)-3-phenyl-1,2,4-triazole (see Triamiphos)
- Aminocarb, chemical definition of, 1; in sprays against *Acrobasis caryae*, 209; in sprays against *Spodoptera litura*, 223; in sprays against Lepidopterous larvae, 348; against *Hylemya floralis*, 420; toxicity of, to *Spodoptera littoralis*, 472; guide to, 545; in sprays against *Diparopsis wateri*, 656-657
- 2-Amino-4-methyl pyrimidine, effect of, on *Anthonomus grandis*, 277
- Amitermes*, attacking *Eucalyptus* in Uganda, 443, 444
- Amitus aleurodinus*, parasitic in *Trialeurodes abutilonea* in Illinois, 304
- Ammonia, as attractant for *Dacus* spp., 214
- Ammonium Carbonate, in baits for *Rhagoletis pomonella*, 352
- Ammonium Sulphate, *Saccharosydne saccharivora* on sugar-cane treated with, 290; in baits for *Dacus oleae*, 578
- Amnophila sabulosa*, parasitic in *Apamea basilinea* in Mongolia, 634-635
- Amomum subulatum*, aphid transmission of mosaic virus disease to, in India, 317; effects of fumigants on, in India, 398, 399; pests of, in India, 440
- Amorphophallus*, *Hepialiscus sordida* on, in Java, 178
- Ampalaya (see *Momordica charantia*)
- Amphibolus venator*, predacious on *Trogoderma granarium* in India, 476
- Amphipoea fucosa paludis*, on maize in Soviet Union, 13
- Amphithales episcopopa*, on *Actinophora fragrans* in Java, 178
- Amphorophora lactucae*, on black currant in Poland, 96
- Ampicillin Trihydrate, effects of, on reproduction of *Myzus persicae*, 496
- Amsacta*, attacking groundnut in India, 318
- Amsacta moorei*, bionomics and control of, in India, 214; attacking groundnut in India, 216; comparative toxicity of insecticides to, in India, 259
- Amsacta lactinea*, *A. moorei* associated with, in India, 214
- Amyl Acetate, *Drosophila melanogaster* not responding to, 289
- Anabasine, as insecticide, 622
- Anacardium occidentale*, pests of, in India, 316; extract from shells of, for protection of freshly felled timber in storage against insect borers and subterranean termites, 615
- Anagrapha falcifera*, on field crops in Alabama, 498
- Anagrus*, species of, parasitising *Empoasca devastans* in India, 86



- Anagrus armatus*, parasitising eggs of *Empoasca curveola* in Chile, 377, 378
- Anagrus flaveolus*, parasitic in *Peregrinus maidis* in Venezuela, 300
- Anagrus*, species of, parasitising *Nipaecoccus vastator* in India, 86
- Anagrus dactylopii*, parasitising *Nipaecoccus vastator* in India, 86
- Anagrus kivuensis*, control of *Planococcus kenyae* by, in Kenya, 242
- Anaphes leptoceras*, *Lixus algeris* parasitised by, in Sicily, 606-607
- Anaphes ovijentatus*, attacking eggs of *Lygus hesperus* in California, 583-584
- Anaphothrips obscurus*, measures against, on grasses in Germany, 101
- Anarsia*, attacking *Achras zapota* in India, 664
- Anarsia ephippias*, attacking groundnut in India, 216
- Anarsia lineatella*, distribution of, in Europe and Mediterranean Basin, control methods used against, effects of, on fruit crops, 333; bionomics and control of, on peach in Portugal, 387
- Anastatus*, list of species of, and their hosts in India, 343
- Anastatus bifasciatus*, parasitic in eggs of *Thaumetopoea pityocampa* in Spain, 389; parasitising *Dendrolimus spectabilis* in Korea, 635
- Anastatus dendrolimus* sp.n., parasitising *Dendrolimus spectabilis* in Korea, 635
- Anastatus disparis*, factors influencing effectiveness of, as egg-parasite of *Lymantria dispar*, 7; effect of low temperature on last-instar larvae of, 136
- Anastatus gastropachae*, parasitising *Dendrolimus spectabilis* in Korea, 635
- Anastrepha fraterculus*, ecology of, in Brazil, 241; control of, on peach in Brazil, 243; parasitised by *Ganaspis pelleranoi* in Argentina, 288
- Anastrepha ludens*, tepa residues on chemosterilized pupae of, 274; reserpine as sterilant for, 359; effect of biotin on reproduction and longevity of, in Mexico, 413; tepa baits tested against in Mexico, 499; as potential pest of *Citrus* in Florida, 543-545
- Anastrepha mombinpraeoptans*, *A. fraterculus* misidentified as, in Brazil, 241
- Anastrepha serpentina*, parasitised by *G. pelleranoi* in Brazil, 288; laboratory rearing of, 593-594
- Anastrepha suspensa*, new records of, in Florida, 211; on guava in Florida, 543-545
- Anatis mali*, growth and development of larvae of, on dry foods in Canada, 348
- Ancistrocerus antilope*, parasitising *Archips cerasivoranus* in Minnesota, 642-643
- Ancistrotermes amphidon*, attacking *Eucalyptus* in Uganda, 443, 444
- Ancistrotermes latiotus*, infestation and control of, on crops in Tanganyika, 445
- Ancylys comptana*, bionomics and control of, on strawberry in Hungary, 617
- Andraca bipunctata*, bionomics and control of, on tea in China, 482, 483
- Aneucelis exilis*, parasitising *Ceutorhynchus quadridens* on rape in Sweden, 182
- Angola, *Bixadus sierricola* and *Anthores leuconotus* on coffee in, 245
- Anicetus brevicaudatus* sp.n., attacking *Cero-plastes* spp. in India, 295
- Anicetus yasumatsui* sp.n., attacking *Cero-plastes* sp. on fig in India, 295
- Anilastus* sp., parasitic in *Archippus oporanus*, 330
- Animert (see 2,4,5,4'-Tetrachlorodiphenyl Sulphide)
- Anisopteromalus calandrae*, parasitic in larvae of *Lasioderma serricorne* in India, 399; parasitising *Sitotroga cerealella* in stored maize in Kenya, 442
- Annona*, pests of, in Somalia, 380
- Annona cherimolia*, predacious on *Porphyrosela minuta* in Chile, 377, 378
- Annona squamosa*, *Anonaepestis bengalella* on, in India, Vietnam, Malaya and Philippines, 73
- Anobium fulvicorne*, attacking deciduous trees in Poland, 324
- Anobium punctatum*, susceptibility of Sitka spruce wood to attack by, in Britain, 181; treatment of wood against, in Germany, 456; records of, infesting textiles in Germany, 521, 522; V.H.F. radio waves against, in wood, 623-624
- Anobium rufipes*, attacking deciduous trees in Poland, 324
- Anoecia setariae*, not transmitting barley yellow-dwarf virus in South Dakota, 292
- Anomala*, attacking groundnut in India, 216
- Anomala horticola*, capacity for reinfestation of, in relation to *Costelytra zealandica*, 177; calculation of capacity for increase of, 233
- Anomis leona*, on cacao in Nigeria, 627
- Anomis sabulifera*, *Bacillus thuringiensis* against larvae of, on jute in India, 372
- Anonaepestis bengalella*, on *Annona squamosa* in India, Vietnam, Malaya and Philippines, 73
- Anonaepestis tamsi*, on *Piper nigrum* in West Africa, 73
- Anopheles quadrimaculatus*, use of larvae of, in tests of insecticides, 32
- Anoplotermes*, distribution of, in Nigeria, 467, 468
- Antelope, DDT residues in, in United States, 641
- Antestia basilewskyi*, on coffee in Africa, 447
- Antestia cincticollis*, on coffee in Africa, 447
- Antestia trivialis*, on coffee in Africa, 447
- Antestia usambarica*, on coffee in Africa, 447
- Antestiopsis crypta* sp.n., on coffee in Africa, 447
- Antestiopsis facetoides* sp.n., on coffee in Africa, 447, 448
- Antestiopsis falsa*, on coffee in Africa, 447
- Antestiopsis intricata*, on coffee in Africa, 447
- Antestiopsis orbitalis*, on coffee in Africa, 447
- Antestiopsis orbitalis bechuana*, on coffee in Africa, 447
- Antestiopsis orbitalis faceta*, on coffee in Africa, 447
- Antestiopsis orbitalis ghesquierei*, on coffee in Africa, 447
- Antheraea eucalypti*, nuclear polyhedra in cell cultures of, 431



- Anthicus*, infesting processed food bari in storage in India, 399
- Anthio (see Formothion)
- Anthocoris antevolens*, predacious on *Psylla pyricola* in California, 38
- Anthocoris nemorum*, toxicity of insecticide sprays to, in Britain, 471
- Anthonomus grandis*, effects of diet on, 30; metabolism of thiotepa in, 39; effect of feeding-deterrent in *Hibiscus syriacus* on, 40; mass marking of, on cotton in Mississippi, 46; diet for, 56; rhythm of susceptibility of, to methyl-parathion, 71; effect of glycogen on, 116; insecticides against, on cotton in Alabama, 165; insecticide application schedules against, on cotton in Alabama, 166; on cotton in Texas, 169; synergism of insecticides against, 169; varietal susceptibility of cotton to; attractiveness of isolated groups of cotton plants to overwintering adults of, in North Carolina, 271; starvation method for selecting diapausing adults of; control of, on cotton in North Carolina, 272; population level of, in relation to damage to cotton in Mississippi, 273; low-volume sprays against, on cotton in Tennessee, 275; effect of anti-metabolites on larvae and adults of, 277; control of, with systemic insecticide and feeding stimulant, on cotton in Texas, 278; oviposition and fecundity of, in mass-rearing laboratory cultures, 280; constituents of cotton bud stimulating feeding by, 281; method for bioassay of plant attractants for, 286; spray technique for implanting eggs of, on artificial diets, 296; surface sterilization of eggs of, with cupric sulphate, 296; effects of, on cotton quality in Texas, insecticides against, 355; effects of different hibernation environments on survival and movement of, in South Carolina, 355; factors affecting population dynamics of, on cotton in Texas, 359; comparative preference of, for glanded and glandless cottons in Mississippi, 360; laboratory rearing of, 361; food-plant selection by migrating adults of, in South Carolina, 362; laboratory techniques for rearing disease-free colonies of, in Mississippi, 363; pathogenicity of *Mattesia grandis* to, in Mississippi, 372; marking adults and eggs of, with dye, 404; tests of  $\gamma$ -radiation for sterilization of, in U.S.A., 412; feeding, oviposition and development of, on glandless cotton in Mississippi, 490; colour preference in feeding behaviour of, 490, 491; spread and control of, on cotton in Texas, 499; metabolism of dimethyl 1-methylcarbamoyl-1-propen-2-yl phosphate in, 507; *Hibiscus syriacus* as alternate food-plant for, in Mississippi, 539; diseases affecting laboratory populations of, 579; measures against overwintering population of, on cotton in Mississippi, 580; infection of, with *Mattesia grandis* induced by feeding stimulant, 586-587; use of, for assay of dimethyl 1-methylcarbamoyl-1-propen-2-yl phosphate in cotton, 589-590; aerial sprays against, on cotton in Louisiana, 591; hexamethylphosphoramide and apholate as chemosterilants for, 594; winter mortality of, on cotton in South Carolina, 596; artificial diet for, based on cotton squares, 645; uric acid in nitrogen metabolism of, 645; infection of *Bracoma mellitor* parasitising larvae of, infected with *Mattesia grandis*, 648; chemoreceptors of, 649
- Anthonomus pomorum*, on apple in Poland, 953
- 453
- Anthores leuconotus*, control measures against on coffee in Angola, 245
- Anthrenus*, records of, infesting textiles in Germany, 521
- Anthrenus flavipes*, treatments of woollen fabrics against, 33; question of synonymy of, 118; effects of  $\gamma$ -radiation on, 235; synthetic rearing medium for, 441; as fabric pest in Canada, 571
- Anthrenus oceanicus*, synonymy of, 118
- Anthrenus scrophulariae*, as fabric pest in Canada, 571
- Anthrenus verbasci*, as fabric pest in Canada, 571
- Anthriscus*, *Ocnogyna baetica* on, in Tunisia, 393
- Antigastra catalaunalis*, bionomics and food-plants of, in India, 216; on sesame in Somalia, 380
- Antilochus coquebertii*, bionomics of, predacious on *Dysdercus koenigii* in India, 501
- Antimycin A, effects of, on reproduction of *Myzus persicae*, 496
- Antirrhinum majus*, as alternative food-plant for *Antigastra catalaunalis* in India, 217
- Antonina graminis*, distribution map of, 617; on *Digitaria decumbens* in British Guiana, 638
- Ants (see also *Camponotus*; *Formica*)
- Ants, destroying other insects, in Virginia, 34; in relation to aphids, 73; in India, 85; measures against, 85; associated with aphids in Poland, 97; attracted by honeydew, 99; preying on *Aonidiella aurantii* and *Coccus hesperidum* in South Africa, 129; *Cinara* attacking *Pseudotsuga menziesii* associated with, in Washington, 152; population studies of, 247; mound-sharing by termites and, in Nigeria, 467; attacking rubber trees in Territory of Papua and New Guinea, 480; preying on *Hyponomeuta padellus malinellus* in Soviet Union, 553; measures against, associated with *Planococcus lilacinus* on coffee in India, 614; *Rhagoletis cerasi* attacked by, 617
- Anuraphis cardui*, on plum in Poland, 96
- Anuraphis helichrysi*, transmission of mosaic virus disease to cardamom and wheat in India, 317; as vector of tobacco vein necrosis virus of potato in Northern Ireland, 336
- Anuraphis maidradicis*, transmitting cucumber mosaic virus in South Dakota, 292; not transmitting barley yellow-dwarf virus in South Dakota, 292
- Anuraphis marchali*, insecticides against, on *Prunus mahaleb* in Bulgaria, 327
- Anuraphis plantaginea*, on apple in Connecticut, 46; Mirids predacious on, 46; interrelations between, and its parasites and hyperparasites on apple in Holland, 121; on apple in Poland, 139; on apple in Italy, 330



- Anuraphis radicola*, on apple in Poland, 139
- Anurida*, on grass and white clover in Holland, in relation to injurious fungi, 383
- Anystis baccharum*, attacking *Eucosma tedella*, 564
- Aonidiella aurantii*, measures against, on grapefruit in California, 32; toxicity of fumigants to, on rose in India, 85; predators of on *Citrus* in South Africa, 129; fecundity of *Aphytis* spp. parasitising, 132; comparisons of toxicants against, in India, 317; as pest of *Citrus* in Argentina and Uruguay, 376; oil-emulsions against, *Coccidophilus citricola* preying on, 376; insecticides against, on oranges in Morocco, 393; *Aphytis lingnanensis* parasitic in, on lemons in South Africa; parasitised by *Aphytis coheni* in South Africa, 395; pathogenicity of *Fusarium episphaeria* for, 428; mineral oils alone or with malathion against, on *Citrus* in Egypt, 473; laboratory methods for rearing of, on lemons, 524
- Aonidiella citrina*, *Pteroptrix albocincta* sp.n. from, in Hong Kong and Formosa, 304
- Aonidiella orientalis*, on papaya in Australia, 450
- Apamea basilinea*, mass increase of, damaging cereal crops in Mongolia, 438; outbreak of, on wheat in Mongolia, parasites of, and control measures against, 634
- Apanteles*, parasitising *Eucosma monitorana* in Wisconsin, 46; reclassification of, 55; *Spatulifimbria castaneiceps* parasitised by, on castor, 260; parasitic in larvae of *Enarmonia ratzeburgiana* in Quebec, 349; parasitic in *Pseudaletia unipuncta* in Ontario, 350; determination of, in *Spodoptera frugiperda*, in Louisiana, 500; *Ecpanttheria icasia* parasitised by, in Costa Rica, 645
- Apanteles absonus*, sp.n., parasitic in *Choristoneura fumiferana* in U.S.A., 463
- Apanteles bourquini*, attacking *Agrotis ipsilon* in Chile, 377
- Apanteles delhiensis*, *Hymenia recurvalis* parasitised by, in India, 217
- Apanteles flavipes*, parasitising *Aporia crataegi* in China, 439
- Apanteles glomeratus*, effect of microsporidiosis on diapause and survival of, parasitising *Pieris brassicae* in Soviet Union, 436; parasitising *Aporia crataegi* in China, 439, 440
- Apanteles loricellae*, parasites of, parasitising *Argyresthia loricella* in New Brunswick, 502
- Apanteles marginiventris*, parasitising *Heliothis* spp., in U.S.A., 539
- Apanteles parasitellae*, secondary hosts of; parasitising *Eucosma tedella* in Germany, 564
- Apanteles rubecula*, parasitising *Pieris rapae* in British Columbia, 594; parasitised by *Tetrastichus rapo* in British Columbia, 594
- Apanteles spurius*, parasitising *Abraxas pantaria* on ash in Portugal, 294
- Apate monachus*, introduced into Brazil, 56
- Apate terebrans*, introduced into Brazil, 56
- Apatele rumicis*, effects of rhythms of light and temperature on diapause in, in Soviet Union, 434
- Aperitmetus brunneus*, attacking tea seedlings in Kenya, 134; insecticides against, 134
- Apechthis ontario*, parasitising *Choristoneura fumiferana* on *Abies balsamea* in Quebec, 152
- Apechthis resinator*, parasitising *Tortrix viridana* on oak in Europe, 123; parasitising *Archips crataeganus* on oak in Soviet Union, 142; parasitising *Archips crataeganus* on oak in Czechoslovakia, 199; parasitising *Tortrix viridana*, 426; host-seeking by; parasitising *Tortrix viridana*, 567
- Apechthis rufata*, parasitising *Tortrix viridana* on oak in Europe, 123; parasitising *Archips crataeganus* on oak in Soviet Union, 142; parasitising *Archips crataeganus* on oak in Czechoslovakia, 199; parasitising *Tortrix viridana*, 426; host seeking by; parasitising *Tortrix viridana*, 567
- Aphaenogaster rudis*, destroying other insects in Virginia, 34
- Aphaereta pallipes*, effect of food on suitability of *Musca domestica* as host for, 566
- Aphelinids, review of, in Soviet Union, 437
- Aphelinus mali*, parasitising *Eriosoma lanigerum* in Rhodesia, 73; unaffected by DDT, 73; released against *Eriosoma lanigerum* on apple in France, 123; bionomics of, in relation to climatic factors, in control of *Eriosoma lanigerum* in France, 391
- Aphelinus semiflavus*, against aphids in greenhouses in Manitoba, 24; parasitic in *Macrosiphum pisum* in Ontario, 351
- Aphelosoma planum*, parasitising *Odonaspis secreta* in Japan, 87
- Aphidecta obliterata*, establishment of, against *Adelges piceae* in North Carolina, 485
- Aphididae, polymorphism in, 184
- Aphidiines, review of, in Czechoslovakia, 630
- Aphidius ervi*, parasitism of *Macrosiphum pisum* by, in Poland, 139
- Aphidius matricariae*, controlling *Myzus persicae* on chrysanthemums in Britain, 507
- Aphidius megourae* sp.n. parasitising *Megoura viciae* in Czechoslovakia and Soviet Union, 455
- Aphidius pulcher*, parasitic in *Macrosiphum pisum* in Ontario, 351
- Aphidius smithi*, parasitic in *Macrosiphum pisum* in Ontario, 351; establishment of, as parasite of *Macrosiphum pisum* in U.S.A., 501
- Aphidius transcaspicus*, parasitising *Hyalopterus amygdali* in Italy, 103; parasitising *Aphis donacis* in Italy, 104; establishment of, against *Hyalopterus pruni* in Czechoslovakia, 391
- Aphids, and virus disease of *Prunus*, 26; method of rearing, 44; apparatus for recording flight patterns of, 46; on *Sorbus*, 55; feeding habits of, 60; nutritional requirements of, and varietal susceptibility of plants to, 66; ants in relation to, 73; insecticides against, on beet in Britain, 80; pyrethrins against, 81; on fruit trees and bushes in Poland, 96; ants associated with, 97; on *Citrus* and peach in Italy, 103; secondary food-plants in relation to, 103; and virus diseases of plants, 117; in relation to virus diseases of wheat, 118; systemic insecticides against, 118; natural enemies of, 121; toxicity of O,O-diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate to, 160; on apple in Wisconsin, 167; parasites of, associated with *Prunus* trees in



- Czechoslovakia, 178; catalogue of, in Turkey, 179; cage for feeding tests of Coccinellid predators of, 180; annual cycles of, 184; effect of predators on, on beet in Soviet Union, 196; sampling of, on beet in Britain, 229; insecticides against, on brussels sprouts in England, 230; on pine in Germany, 237; cellulose-hydrolyzing factor in saliva of, 239; parasites of, in Denmark; recorded on cultivated plants in Norway, 239; captured by adhesive trap in India, 261; control of, on cotton in North Carolina, 272; control of, on *Lupinus luteus*, 273; as vectors of virus disease of cardamom, 317; infesting vegetables in Bulgaria, 328; predators of, on apple in Italy, 330; laboratory rearing of predatory Coccinellids on, in Canada, 348; insecticide residues against, on vegetables in U.S.A., 363; comparison of methods for collection of, on lucerne in Massachusetts, 368; as pests of *Citrus* in Argentina and Uruguay, 376; endrin against, 376; viruses transmitted by, to strawberry in Spain, 388; control of, on crops in Italy, 390; control of, on leafy vegetables in U.S.A., 403; control of polymorphism in, 405; time of flight in relation to incidence of beet yellows in Britain, 446; rearing of, on leaf disks, 451; Aphidiine parasites of, in Soviet Union, 455; systemic insecticides against, on potato in Britain, 469; integrated control methods for, suitability of, as food for Coccinellids in Britain, role of host plant in delaying damage by, 506; associated with trees in Soviet Union, 508; transmission of non-persistent viruses by, 518; on fruit trees in Iran, 519; Coccinellids attacking, in France, 559; attacked by gall-midges in Britain, 569; records of, in traps in Florida, 589; *Coccinella septempunctata* reared on, 595; oesophageal and stomach inclusions of, feeding on crucifers 600; importance of natural foci for Aphidiine parasites of, 603; effect of insecticides against, on beneficial fauna of fruit trees in Switzerland; 629; parasites of, in Czechoslovakia, 630; on maize in Soviet Union, 633
- Aphis craccivora*, transmitting tristeza virus of *Citrus* in India, 84; toxicity of insecticides to, 85; menazon against, 133; virus causing rosette disease of groundnuts transmitted by, in Ghana, in Uganda, 133; varietal resistance in groundnut to rosette disease transmitted by, in Nyasaland, 134; attacking groundnut in India, 216; relationship of, to broad bean mosaic virus in India, 259; effect of food plant nutrition on, 260; control of, on cotton in North Carolina, 272; effect of plant nutrients on fecundity of, in India, 317; rearing of pure lines and mass cultures of, in Germany, 341; on pea in Iraq, 584; factors affecting production of alates in, 598
- Aphis donacis*, on *Arundo donax* in Italy, natural enemies of, 103
- Aphis fabae*, ingestion of food by, on *Vicia faba*, 79; toxicity of dimethoate to, 92; bionomics of, on *Eunymus europaeus* in Poland, 96; experiments in control of, in Poland, 98; insecticidal activity of N-methylenefluoroacetamide derivatives against, 114; effectiveness of *Coccinella septempunctata* in suppressing population of, on beet in Czechoslovakia, 137; on apple in Poland, 139; infesting crucifers in Poland, 139; effectiveness of disulfoton against, on beet in Poland, 140; O,O-diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate against, on nasturtium, 160; sampling of, on beet in Britain, 229; radionuclide tracer studies of dispersal of, in beet fields in Belgium, 229; effect of plant factors on growth of, 290; insecticides against, on sugar-beet in Soviet Union, 321; gut characters as means of determining origin of, in Britain, 335; not transmitting clover yellow vein virus in Britain, 336; viruses transmitted by, on beet in Germany, 338; rearing of pure lines and mass cultures of, in Germany, 341; as food for laboratory-reared Coccinellid larvae in Canada, 348; on sugar beet and weeds in Britain, 384; time of flight in relation to incidence of beet yellows in Britain, 446; on beans in Czechoslovakia, 455; transmitting yellows viruses of sugar beet in Britain, 505; disulfoton granules against, on beet in Poland, 513; control of, reducing transmission of viruses to sugar-beet in Czechoslovakia, 516; on beet in Iran, 519; *Syrphus luniger* reared on, in Germany, 521; damaging sugar-beet, control measures against, in Soviet Union, 551; population fluctuations and densities of, on beet in Germany, 564; disulfoton granules against, on beet in Switzerland, 577; reproduction of *Adalia bipunctata* reared on, 598; histological function of feeding punctures of, on broad beans, 621
- Aphis farinosa*, on willow in Italy, 103
- Aphis gossypii*, transmitting tristeza virus of *Citrus* in India, 84; toxicity of insecticides to, 85; insecticides against, on potato in India, 146; on cotton in Alabama, 166; transmitting mosaic virus of papaya in India, 217; control of, on cotton in North Carolina, 272; insecticides against, on cotton in Texas, 278; food-plants of, in Venezuela, 343; tests of insecticides against, on cotton, 357; *Spanogonicus albofasciatus* predacious on, on cotton in Arizona, 417; chemical control of, on cotton in Uganda, 442; rearing, food-plants and relation to cucumber virus of, in France, 457; on cotton in Iran, 519; temperature in relation to transmission of virus disease of potato by, in Poland, 534; systemic insecticides against, on cotton in Texas, 589; use of, for assay of dimethyl 1-methylcarbamoyl-1-propen-2-yl phosphate in cotton, 589-590; DDT applied by hand-operated spraying machines against, on cotton in Uganda, 625; not transmitting tristeza virus of *Citrus* in Israel, 636
- Aphis grossulariae*, *Aphis triglochis* resembling, 653
- Aphis idaei*, on raspberry in Poland, *Syrphid* flies predacious on, 96
- Aphis indosacchari*, outbreak and natural enemies of, on sugar-cane in India, 479
- Aphis lactucae*, on black currant in Poland, 96



- Aphis nasturtii*, temperature in relation to transmission of virus disease of potato by, in Poland, 534; disulfoton granules against, on potato in Switzerland, 577
- Aphis nerii*, on oleander in Italy, 103; toxicity of analogues of dichlorvos, trichlorphon and naled to, 283
- Aphis pomi*, on apple in Italy, 5; Mirids predacious on, 46; on apple in Connecticut, 46; *Syrphus vitripennis* attacking, on apple in Poland, 96; transmitting *Erwinia amylovora* to apple and pear, 117; interrelations between, and their parasites and hyperparasites on apple in Holland, 121; on apple in Poland, 139; effects of *Bacillus thuringiensis* and captan on, on apple in Wisconsin, 167; on apple in Italy, 330; effect of winter sprays on, on apple in Poland, 453; not transmitting *Citrus tristeza* virus in Israel, 636
- Aphis sacchari*, outbreak and natural enemies of, on sugar-cane in India, 479
- Aphis schneideri*, *Aphis triglochis* resembling, 653
- Aphis spiraeicola*, control of, on *Citrus* in Venezuela, 301
- Aphis triglochis*, infesting currant, food-plants of, in Britain and Holland, 653
- Apholate, in tests as chemosterilant for *Spodoptera frugiperda*, 31; as chemosterilant for *Ceratitis capitata*, 51; as chemosterilant for *Callosobruchus chinensis*, 148; and metepa, 148; mating competitiveness of males of *Callosobruchus chinensis* treated with, 151; effect of, on *Trichoplusia ni*, 278; effect of, on *Diabrotica balteata*, 279; effect of, as chemosterilant for *Macrosiphum pisum*, 361; effect of, as sterlant for *Popillia japonica*, 364; sterilization of *Hylemya brassicae* with, 490; effect of, on reproduction of *Myzus persicae*, 496; as chemosterilant for *Dacus oleae*, 578; as chemosterilant for *Anthonomus grandis*, 594; as chemosterilant for *Dendrolimus spectabilis*, 635
- Aphoxide (see Tapa)
- Aphrodes bicinctus*, *Ballota* split-leaf virus transmitted by, in Britain, 232
- Aphrophora canadensis*, bionomics of, 68; on pine in California, 68
- Aphrophora parallela*, in Florida, 543; effect of systemic insecticides against *Diprion similis* on, 588
- Aphrophora permutata*, bionomics of, 68; on pine in California, 68
- Aphrophora quadrinotata*, in Florida, 544
- Aphrophora saratogensis*, insecticides against, 36; on *Pinus resinosa* in U.S.A., 36; in Florida, 544
- Aphthana euphorbiae*, on flax in Soviet Union, 12
- Aphycus luteolus*, parasitising Coccids in U.S.A. 60; evaluation of host suitability for, 304
- Aphycus orientalis*, introduced into U.S.A. from Japan, parasitising *Coccus pseudomagnoliarum*, 61
- Aphytis africanus* sp.n., formerly believed to be bisexual form of *A. chrysomphali* in South Africa, 130; fecundity of, parasitising *Aonidiella aurantii*, 132;
- Aphytis chrysomphali*, attacking Coccids on *Citrus* in Africa, 130; fecundity of, parasitising *Aonidiella aurantii*, 132; *Aspidiotus destructor* parasitised by, in New Hebrides, 224
- Aphytis coheni*, introduction of, against Coccids on *Citrus* in South Africa, 130; fecundity of, parasitising *Aonidiella aurantii*, 132; factors influencing host-finding by, attacking Coccids in South Africa, 395
- Aphytis fisheri*, proposed introduction of, against Coccids on *Citrus* in South Africa, 130
- Aphytis holoxanthus*, introduction of, against Coccids on *Citrus* in South Africa, 130; fecundity of, as parasite of *Aonidiella aurantii*, 132; factors influencing host-finding by, attacking *Chrysomphalus ficus* in South Africa, 395
- Aphytis lepidosaphes*, proposed introduction of, against Coccids on *Citrus* in South Africa, 130
- Aphytis lingnanensis*, introduction of, against Coccids on *Citrus* in South Africa, 130; fecundity of, parasitising *Aonidiella aurantii*, 132; fecundity of, parasitising Coccid hosts in South Africa, 395
- Aphytis melinus*, introduction of, against Coccids on *Citrus* in South Africa, 130; fecundity of, parasitising *Aonidiella aurantii*, 132
- Aphytis mytilaspidis*, parasitising *Quadraspidotus perniciosus* in Germany, 102; parasitising *Pinnaspis aspidistrae* in Bulgaria, 557
- Aphytis proclia*, parasitising *Quadraspidotus perniciosus* in Germany, 102
- Apion*, infesting clover in Soviet Union, 552
- Apion apicans*, insecticides against, on clover in Soviet Union, 552
- Apion corchori*, parathion sprays against, on jute in India, 213
- Apion seniculum*, bionomics and control of, on clover in Soviet Union, 552
- Apion vires*, bionomics and control of, on clover in Soviet Union, 552
- Apis dorsata*, measures against, removing pollen of oil palm in India, 480
- Apis indica*, *Protaetia aurichalcea* feeding on pollen stores of, in India, 534
- Apium graveolens*, *Aphis gossypii* on, in France, 457
- Apomyia caesar*, parasitising *Choristoneura fumiferana* on *Abies balsamea* in Quebec, 152
- Aporia crataegi*, parasites, bionomics and control of, on apple in China, 439
- Apple, pests of, in Italy, 5; *Lymantria dispar* on, in Poland, 9; pests of, in Iran, 10; pests of, in Canada, 21; *Panonychus ulmi* on, 23; insecticide residues on, 25; pests of, in U.S.A., 26; use of, in rearing *Dacus tryoni*, 45; pests of, in Connecticut, 46; pests of, in Chile, 47; *Panonychus ulmi* on, in England, 49; *Rhynchaenus fagi* on, in France, 53; *Cydia pomonella* on, in Nova Scotia, 56; *Eriosoma lanigerum* on, in Rhodesia, 73; systemic treatment of, 73; *Cydia pomonella* on, in Britain, 75; persistence of insecticides on, 75; *Lithocolletis blancardella* on, in Soviet Union, 89;



- Aegeria myopaeformis* on, in Soviet Union, 90; *Cydia pomonella* on, in Italy, 93; question of toxic residues of insecticides in, 93; method for determining residues of phenthoate in, 93, 94; fauna overwintering in the bark of, in Poland, 95; aphids on, in Poland, 96; *Hyponomeuta padellus malinellus* on, in Poland, 97; *Quadraspidiotus perniciosus* on, in Germany, 102; *Aphis pomi* in relation to fire blight of, 117; distribution of *Typhlodromus pyri* and *Panonychus ulmi* on, in Holland; interrelations between aphids and their parasites and hyperparasites on, in Holland, 121; integrated control measures for; population of *Panonychus ulmi* and *Typhlodromus pyri* on, in Holland, 122; integrated pest control on, in France, 123; insect pests of, in Malta, 135; insecticide residues on, 137; aphids on, in Poland, 139; *Panonychus ulmi* on, in Quebec, 157; laboratory-reared *Rhagoletis pomonella* ovipositing on, 162; effect of *Bacillus thuringiensis* on arthropod fauna on, in Wisconsin, 167; sampling populations of *Lepidosaphes ulmi* on, in Quebec, 179; residues of lead and arsenic in, 183; carbaryl residues on, 186; *Argyresthia conjugella* on, in Soviet Union, 190; *Archips rosanus* on, in Soviet Union, 191; *Enarmonia formosana* on, in Soviet Union, 195; *Lithocolletis pyrifoliella* on, in Soviet Union, 195; *Typhlocyba rosae* on, in Bulgaria, 197; changes in population of leaf rollers on, in Ontario, 201; sampling predator populations on, in Nova Scotia, 203; *Eulecanium* spp. on, in Ontario, 203; *Prospaltella perniciosi* parasitising *Quadraspidiotus perniciosus* on, in France, 225; *Cydia pomonella* on, in France; *Zeuzera pyrina* on, in France, 227; *Stigmella malella* on, near Paris, 228; *Enarmonia formosana* on, in Britain, 229; residues of demeton on, 238; tainting of, by pesticides, 240; pests of, in Wisconsin; insecticide treatment affecting yields of, 279; *Panonychus ulmi* on, in California, 284; treatment of, in mass rearing of *Conotrachelus nenuphar*, 286; *Bryobia redikorzevi* and *Panonychus ulmi* on, in Bulgaria, 325; *Lithocolletis blancardella* on, in Rumania, 328; arthropod fauna of, in Italy; *Archippus oporanus* on, in Italy, 330; pests of, in Germany, 337; *Rhagoletis pomonella* on, in Michigan, 352; studies on integrated control of pests of, in Wisconsin, 360; *Panonychus ulmi* on, in Virginia, 369; pests of, in Lebanon, 381; Coccids on, in Italy, 390; *Eriosoma lanigerum* in relation to *Aphelinus mali* on, in France, 391; *Hyponomeuta padellus malinellus* on, in Yugoslavia; *Malacosoma neustria* on flowers of, in British Columbia, 421; *Aporia crataegi* on, in China, 439; toxicity of insecticides to, used against *Cydia pomonella*, 448; *Bryobia praetiosa* on, in Poland, 453; pests of, in Poland, 453; *Rhynchaenus fagi* on, in Germany, 456; insecticide residues on, 461; *Panonychus ulmi* on, in Britain, effect of sprays on fauna of, 470; *Blepharidopterus angulatus* on, in Britain; *Typhlodromus pyri* on, in Britain, 471; avoidance of russetting of, by dicofol, 472; *Lymantria dispar* on, in Connecticut, 491; *Panonychus ulmi* on, in New York State, 498; aphids on, in Soviet Union; *Quadraspidiotus perniciosus* on, in Soviet Union, 508; varietal resistance of, to *Eriosoma lanigerum* in Soviet Union, 509; *Hyphantria cunea* infestation of, in Soviet Union, 510; *Panonychus ulmi* on, in Germany, 522; *Eriosoma lanigerum* on, in South Africa, 532; natural enemies of *Hyponomeuta padellus malinellus* on, in Soviet Union, 553; *Hyponomeuta* spp. on, in Switzerland, 561; predicting occurrence of *Cydia pomonella* on, in Switzerland, 562; *Lithocolletis corylifoliella* on, in Holland; growing points of, attacked by *Cnephasia longana*, 568; method of visual assessment of infestation by arthropod pests of, in Switzerland, 628; comparison of methods for assessing populations of arthropods on; methods of estimating populations of *Panonychus ulmi* on, in Switzerland, 629; *Bryobia rubrioculus* on, in Uruguay, 640; varietal susceptibility of, to mites in Michigan, 642; *Panonychus ulmi* on, in Italy, 651; *Panonychus ulmi* on, in Holland, 652; development of *Cydia pomonella* in, in Holland, 653
- Apple Maggot (see *Rhagoletis pomonella*)
- Apricot, *Anarsia lineatella* on, in Cyprus, 333; *Parlatoria oleae* on, in Italy, 390; *Rhynchaenus fagi* on, in Germany, 456; *Ceratitis capitata* on, in Israel, 613
- Aprostocetus diplosidis*, parasitising *Contarinia sorghicola* in Italy, 389
- Aptesis*, parasitising *Pachynematus itoi* in Japan, 660
- Aptesis basizona*, parasitising *Diprion pini*, 106; parasitising *Neodiprion sertifer* on pine in Czechoslovakia, 200; parasitising *Diprion pini* in Germany, 378
- Aptesis opaca*, parasitising *Diprion nipponicus*, 660
- Aptesis setiferae*, parasitising *Diprion nipponicus*, 660
- Aptinotrips rufus*, measures against, on grasses in Germany, 101
- Arabia, *Schistocerca gregaria* in, 51, 597
- Arabica Coffee (see *Coffea arabica*)
- L-Arabinose, attractive to *Eurytoma roddi*, 57
- Arachis hypogaea* (see Groundnut)
- Aradus cinnamomeus*, predators, parasites, bionomics and ecology of, in pine plantations in Czechoslovakia, 454
- Aramite, toxicity of, to *Tetranychus cinnabarinus*, 164; in sprays against *Panonychus ulmi*, 381
- Aramul (see Methyl-parathion)
- Arborol AC (see DNC, and fenson in oil emulsion)
- Arbutus*, *Aleurotrachelus jelinekii* on, in Soviet Union, 510
- Archanaara oblonga*, frass of, attracting females of *Lydella grisescens*, 293
- Archiboreoiulus pallidus*, traps for estimating populations of, on beet in Belgium, 577
- Archippus oporanus*, bionomics of, on apple and pear in Italy, Hymenoptera parasitic in, 330
- Archips argyrospilus*, changes in population of, on apple in Ontario, 201; damage to sour



- cherry by, in Wisconsin, 270; infestation of, on insecticide-treated apple in Wisconsin, 279
- Archips cerasivoranus*, as food for laboratory-reared *Podisus maculiventris* in Quebec, 349; bionomics and parasites of, in Minnesota, 642
- Archips crataeganus*, bionomics, parasitism and control of, on oak in Soviet Union, 142; natural control of, on oak in Czechoslovakia, 199
- Archips griseus*, larval instars of, on oak in United States, 179
- Archips rosanus*, on *Ribes* in Poland, 9; bionomics and parasitism of, on fruit trees, in Soviet Union, 191; insects found in abandoned feeding sites of, on currant and gooseberry in Poland, 603
- Archips semiferanus*, changes in population of, on apple in Ontario, 201
- Archips xylosteanus*, parasitised by *Nemorilla maculosa* on *Quercus suber* in Portugal, 294
- Archontophoenix alexandrae*, *Agonoxena phoenicia* sp.n. on, in Queensland, 445
- Areca catechu*, *Elymnias caudata* on; mites on, in India, 664
- Areca Palm* (see *Areca catechu*)
- Arescon enocki*, parasitising *Empoasca devastans* in India, 86
- Argentina, *Cyclocephala signaticollis* on crops in, 47; *Empoasca paraobliqua* sp.n. attacking tea in, 180; *Actinote pellenae pellenae* damaging sunflower in, 287; pesticide treatments for fruit trees in, 288; *Ceratitis capitata* in orchards in; pests and diseases of *Citrus* in, 376; laboratory rearing of *Ceratitis capitata* in; *Tephromyiella neuquenensis* parasitising grasshoppers in, 409
- Argyresthia conjugella*, infestation, bionomics and control of, on apple and *Sorbus aucuparia* in Soviet Union, 190
- Argyresthia ephippella*, bionomics and control of, on cherry in Soviet Union, 553
- Argyresthia loricella*, population dynamics and natural enemies of, in New Brunswick, 501
- Argyresthia trifasciata*, on juniper and *Thuja* in Switzerland, 95
- Argyrogramma basigera*, on field crops in Alabama, 498
- Argyrogramma verruca*, on field crops in Alabama, 498
- Argyroploce antiquana*, synonym of *Endothenia quadrimaculana*, 561
- Argyroploce leucaspis*, bionomics of, on *Litchi chinensis* in India, 216
- Argyrotaenia velutinana*, effect of *Bacillus thuringiensis* on, on apple in Wisconsin, 168; changes in population of, on apple in Ontario, 201; swollen abdomen in, treated with parathion, 276; infestation of, on insecticide-treated apple in Wisconsin, 279; insecticide sprays against, on grape vines in Pennsylvania, 358; integrated control of, on apple in Wisconsin, 360
- Arhopalus asperatus*, on pine in California, 116
- Arizona, honey bees as pollinators of cantaloup melons in, 38; *Coccus pseudomagnoliarum* on *Citrus* in, 60; *Aleurocybotus occiduus* on grasses in, 62; *Encarsia lutea* parasitising Lepidoptera and Aleyrodids on cotton and sunflower in, 168; aerial spraying against cotton pests in, 171; *Paratrioza cockerelli* and *Myzus persicae* on potato in, 268; spider mites of, 343; *Spanogonicus albofasciatus* predacious on insects and mites on cotton in, 417; bees associated with safflower in, 524; natural enemies of *Lygus* on lucerne in, 583; control of *Lygus hesperus* on cotton in, 595; trap for *Heliothis* in, 596
- Arkansas, new records of insect pests in; *Lissorhoptrus oryzophilus* on rice in, 159; predacious insects, spiders, and mites on cotton in, 179; birds as predators of overwintering larvae of *Zeadiatraea grandiosella* and *Ostrinia nubilalis* in maize stalks in; sampling of predacious arthropods on soy bean in, 302; *Cinara watsoni* on pine in; insects of pine cones in, 303; predators of *Heliothis zea* on cotton in, 416; *Neodiprion taedae linearis* on pine in, 643
- Armac C, effects of, on deposits of DDT, 366
- Armac 18D, effects of, on deposits of DDT, 366
- Armire, effects of, on mechanism of action of organophosphorus compounds on insects, 13
- Arprocarb, chemical definition of, 1; against *Chaitophorus populellus*, 27; against *Sitona cylindricollis*, 40; against *Hylemya trichodactyla*, 43; sunlight and ultra-violet light not affecting, 186; in granules against *Pediasia* spp., 269; against *Hylemya antiqua*, 356; in sprays against *Argyrotaenia velutinana*, persistence of, on grape foliage, 358; in granules against *Phyllotreta pusilla*, effects of, on plants, 414; in granules against resistant *Psila rosae*; toxicity of, to emergent seedlings, 421; effect of temperature on, against *Cotinis nitida*, 485; against *Pogonomyrmex occidentalis*, 486; labelled with <sup>14</sup>C, fate of, in rats, 524; in sprays against *Neodiprion taedae linearis*, 643; *Myzus persicae* not resistant to, 650
- Arquard 12-50 (see Alkyl Quaternary Ammonium Chloride)
- Arrenoclavus koehleri*, *Gnorimoschema absoluta* parasitised by, in Chile, 377
- Arrhenatherum elatius*, Thysanoptera on, in Germany, 101
- Arsenic, residues of, in apples and pears, 183; in mixture against termite attack on beech and pine, 408
- Arthropods, effect of environmental conditions on sampling of, on soy bean in Arkansas, 302; light-weight leaf cage for small species of, 619
- Artichokes (see *Cynara*)
- Artipus floridanus*, on *Citrus* in Florida, 543
- Artocarpus*, *Dacus dorsalis* on, in Rota, 37
- Artona funeralis*, egg-laying habits of, 48
- Arundinaria*, not suitable as food plant for *Lema melanopa* in Indiana, 307
- Arundo donax*, as food-plant of *Aphis donacis* in Italy, 103
- Asaphes vulgaris*, hyperparasitism by, reared from aphids on apple in Holland, 121
- Ascorbic Acid, in diets for insects, 34; in diets for Lepidoptera, 87; in diet for *Heliothis zea*, 170; in diet for *Diatraea saccharalis*, 268



- Asecodes*, species of, as parasite of eggs of *Heterarthrus ochropodus* in Italy, 331
- Ash (see *Fraxinus*)
- Ash, Mountain (see *Sorbus aucuparia*)
- Asia, rice stem-borers in, 481
- Asolcus basalis*, introduction and release of, against *Nezara viridula smaragdula* in Hawaii, 173
- Asolcus djadetchkoi*, host range of, in Soviet Union, 189
- Asolcus festivae* sp.n., host range of, in Soviet Union, 189
- Asolcus pseudoturesis*, host range of, in Soviet Union, 189
- Asolcus reticulatus reticulatus*, host range of, in Soviet Union, 189
- Asolcus reticulatus volgensis*, host range of, in Soviet Union, 189; parasitising eggs of *Eurygaster integriceps* in Soviet Union, 549
- Asolcus rufiventris*, host range of, in Soviet Union, 189
- Asolcus scutellaris*, host range of, in Soviet Union, 189
- Asolcus semistriatus*, host range of, in Soviet Union, 189; against *Eurygaster integriceps* in Iran, 519; parasitising eggs of *Eurygaster integriceps* in Soviet Union, 549
- Asolcus simoni*, host range of, in Soviet Union, 189
- Asolcus vassilievi*, *A. reticulatus reticulatus* misidentified as, 189; host range of, in Soviet Union, 189
- DL-Aspartic acid, attractive to *Eurytoma roddi*, 57
- Aspen (see *Populus tremuloides*)
- Aspergillus candidus*, association of stored-wheat insects with, 623
- Aspergillus chevalieri*, association of stored-wheat insects with, 623
- Aspergillus effusus*, attacking *Coleophora laricella*, 525
- Aspergillus flavus*, isolated from eggs of *Trichoplusia ni* in Wisconsin, 537; feeding and oviposition of *Cryptolestes ferrugineus* on, 540; hindering laboratory rearing of *Opius* on *Ceratitis capitata*, 607
- Aspergillus fumigatus*, feeding and oviposition of *Cryptolestes ferrugineus* on, 540
- Aspergillus niger*, feeding and oviposition of *Cryptolestes ferrugineus* on, 540
- Aspergillus ochraceus*, feeding and oviposition of *Cryptolestes ferrugineus* on, 540
- Aspergillus parasiticus*, association of stored-wheat insects with, 623
- Aspergillus repens*, association of stored-wheat insects with, 623
- Aspergillus versicolor*, feeding and oviposition of *Cryptolestes ferrugineus* on, 540; association of stored-wheat insects with, 623
- Aspidiella hartii*, distribution map of, 617
- Aspidiotophagus citrinus*, parasitising *Quadraspidiotus perniciosus* in Germany, 102; parasitising *Pinnaspis aspidistrae* in Bulgaria, 557
- Aspidiotus destructor*, occurrence and biological control of, on coconut in New Hebrides, 223-224; on banana and coconut in Somalia, 380; distribution map of, 617
- Aspidiotus hederæ*, *Aphytis lingnanensis* parasitic in, on watermelons in South Africa, 395; parasitised by *Aphytis coheni* in South Africa, 395
- Aspirator, for collecting small arthropods, 56
- Asterolecanium puteanum*, on holly in Florida, 543
- Astragalus monspessulanus*, *Therioaphis trifolii brevipedis* subsp.n. on, 308
- Athalia glabricollis*, effect of photoperiod and temperature on diapause of, in Hungary, 632
- Athalia rosae*, method of rearing, 53
- Athalia rosae ruficornis*, bionomics and control of, on cruciferous crops in China, 483
- Atherigona indica*, insecticides against, on sorghum in India, 262
- Athesapeuta cyperi*, food-plant range of, introduced against nutgrass in Hawaii, 175
- Atlox 3300 (see Isopropyl Amine Dodecyl Benzenesulphonate)
- Atmosphere, insecticide contamination of, in United States and Canada, 248; residues of organochlorine insecticides in, in Britain, 618
- Atmospheric Pressure, Low, effects of, on *Carpoglyphus lactis*, 387
- Atomacera debilis*, *A. desmodii* as synonym of, 155; attacking *Desmodium* spp. in Ontario, 155
- Atomacera desmodii*, as synonym of *A. debilis*, 155
- Atomaria linearis*, insecticide control of, on sugar-beet in Britain, 386; seed treatments against, on sugar-beet in Czechoslovakia, 516
- ATP (see Adenosine-5'-triphosphate)
- Atractomorpha crenulata*, attacking ground nut in India, 216
- Atractotomus mali*, predacious on aphids in Connecticut, 46
- Atta texana*, pelleted mirex bait for control of, in Louisiana, 492
- Attagenus*, species of, in Soviet Union, 55; records of, infesting textiles in Germany, 521
- Attagenus fasciatus*, synonymy of, 118
- Attagenus megatoma*, treatments of woollen fabrics against, 33; method of testing moth-proofing treatments against, 240; effects of different surfaces on toxicity of insecticides against, 353; sex pheromones in females of, 487; toxicity of fumigants to, 488; as fabric pest in Canada, 571; effect of  $\gamma$ -radiation on, 588
- Attagenus piceus* (see *Attagenus megatoma*)
- Attractants, chemicals as, for honey bees, 180; for insects, 184; use of, as alternate method of pest control, 248; use of, in pest control, 288
- Auchenorrhyncha, survey of, on cereals and grains in Sweden, 345
- Aulocara elliotti*, cyclical temperature effects on diapause termination of eggs of, 620; rearing of, 646
- Aulonium trisulcum*, as predator of *Scolytus* spp. on elm in Spain, 128
- Aureomycin, in diets for insects, 34
- Australia, *Cyclocephala signaticollis* in, 47; *Nephotettix apicalis* in, 87; treatment and storage of export wheat in, 238; parasites of



- Phoracantha semipunctata* in, 245; susceptibility of *Sitophilus* and *Tribolium* spp. to  $\gamma$ -radiation in, 252; *Paropsis atomaria* on *Eucalyptus blakelyi* in, 292; Coccids on papaya in, 450; *Dacus tryoni* on *Citrus* in, 543
- Australia, South, *Chortoicetes terminifera* in, 266
- Australia, Western, *Heteronychus arator* in market gardens in; *Spodoptera litura* on cotton in, 222
- Austria, *Dasyneura tetensi* on black currant in, 54; list of parasites and hosts reared in, 116; *Prospaltella perniciosi* parasitising *Quadraspidiotus perniciosus* in, 294; *Anarsia lineatella* in 333; *Hemichroa crocea* infesting *Alnus viridis* in, 456; *Zeiraphera diniana* on larch in, 520; *Stilpnolia salicis* in windbreaks in, 521; *Dendrolimus pini* on pine in, 562; examination of milk samples for DDT residues in, 654; *Autographa gamma* and *Agrotis exclamatoris* in, 654; *Formica* spp. in, 655
- Autographa biloba*, on field crops in Alabama, 498
- Autographa gamma*, analysis of light-trap catches of, in Austria, 654
- Avena fatua*, thrips on, in Holland, 341; infestation of, by *Oscinella frit* in Rumania, 462
- Avena sativa*, plant density in relation to arthropods on, in Georgia, 487
- Avocado, mites of subfamily Phytoseiinae on, in Guatemala, 211;  $\gamma$ -radiation as quarantine treatment of, 284; *Oligonychus yotheri* on, in Chile, 377; *Trialeurodes floridensis* on, in Florida, 416
- Axiagastus cambelli*, on coconut in New Hebrides, 223
- Azadirachta indica*, powder from seeds of, protecting grain from Coleoptera in India, 259
- Azan, staining method with, for inclusion-body viruses, 572
- Azinphos-ethyl, tests of, against *Brachycolus noxius*, 83; toxicity of, to *Cydia pomonella*, 75; and azinphosmethyl, in sprays against *Myzus persicae*, 166; determination of residues of, 180; in sprays against *Acrobasis caryae*, 209; in sprays against *Stigmella malella*, 228; effect of, on apple, against *Cydia pomonella*, 448; in sprays against *Petrobia latens*, 449, 450; against *Phthorimaea operculella*, 449; and azinphos-methyl, in sprays against *Agrotis orthogonia*, 590; in sprays against *Diparopsis watersi*, 656
- Azinphos-methyl, against *Cydia pomonella*, 10; against *Panonychus ulmi*, 26; ineffective against *Miccotrogus picirostris*, 29; against *Psylla pyricola*, 38; against *Sitona cylindricollis*; effects of, on bees, 40; against *Leptinotarsa decemlineata*, 52; persistence of, on apple, 75; toxicity of, to *Spodoptera littoralis*, 84; decline in residues of, applied in sprays to lucerne, 156; in sprays and in fertiliser mixtures against *Hylemya brassicae*, 157; against *Conotrachelus nenuphar*, 165; in tests against *Diatraea*; in sprays against cotton pests; in sprays against *Myzus persicae*, 166; determination of residues of, 180; against *Lithocolletis pyrifoliella*, 195; in sprays against *Paramyelois transitella*, 206; in sprays against Coccids, 208; with azinphosethyl, in sprays against *Acrobasis caryae*, 209; alone and with DDT, in sprays against cotton bollworms, 211; in sprays against cotton pests, 215; in sprays against *Cydia pomonella*, 227; not effective against *Enarmonia formosana*, 230; in sprays against *Tetranychus telarius*, 232; swelling of abdomen in *Cydia molesta* treated with, 276; alone and with ethyl-DDD, against *Psylla pyricola*, 282; in sprays against *Panonychus ulmi*, 284; in sprays against *Lema melanopa*, 302; against *Spodoptera littoralis*, 357; in sprays against *Argyrotaenia velutinana*, persistence of, on grape foliage, 358; residues in milk from forage treated with, 418; spectrophotofluorometric method for determining residues of, in milk and animal tissues, 419; in granules against resistant strains of *Hylemya brassicae*, 421; and glyodin, in control of *Cydia pomonella*, 448; in sprays against *Petrobia latens*, 449; in sprays against *Bryobia praetiosa*, 453; effect of, in drenches against *Steneotarsonemus laticeps*, on narcissus; in sprays against *Eucosma uddmanniana*, 470; toxicity of, in sprays, to predacious insects, 471; in sprays against *Heliothis zea*, 486; aerial application of, against *Hypera variabilis*; toxicity of, to *Hylemya brassicae*, 493; in sprays against *Hypera variabilis*, 497; in sprays against *Rhagoletis cerasi*, 514; in sprays against *Dasyneura pyri*, 515; against *Cnephasia longana*, 568; in sprays against *Chlamisus cribripennis*, 581; and azinphos-ethyl, in sprays against *Agrotis orthogonia*, 590; alone and with oil emulsions, in sprays against *Thrips tabaci*, 590; and carbamates, against *Drosophila melanogaster*, 599; tests of, against *Phthorimaea operculella*, 613; and Bordeaux mixture, in sprays against *Xylosandrus compactus*, 615; in dusts against *Phyrdenus muriceus*, 639; development of resistance to, in *Psylla pyricola*, 643; in sprays against *Tetranychus telarius*, 652
- Azodrin (see Dimethyl 1-Methylcarbamoyl-1-propen-2-yl Phosphate)
- Azofos (see Methyl-parathion)
- Azores, *Liriomyza bryoniae* on *Solanum dulcamara* in, 112
- Azotox (see DDT)
- Azotox M-25 (see DDT)
- Azteca *paraensis bondari*, measures against, damaging cacao in Brazil, 287
- Azya trinitatis*, not successful against *Aspidiotus destructor* in New Hebrides, 224

## B

B-77 (see Ethoate-methyl)

*Bacillus*, species of, infecting *Ephestia kuehniella*, and effect of beneficial insects on epizootics of, 49

*Bacillus amylovorus*, *Campylocoma verbasci*, as vector of, 46

*Bacillus cereus*, spore preparations of, against *Lymantria dispar*, 389; question of relation of, to *B. thuringiensis*, 426



- Bacillus entomocidus subtoxicus*, spore preparations of, against *Lymantria dispar*, 389
- Bacillus popilliae*, infecting *Melolontha melolontha* and *Popillia japonica*, 427
- Bacillus thuringiensis*, against *Stilpnobia salicis*, 8; against *Evagora milleri*, 42; exotoxin of, against larvae of *Athalia rosae*, 53; against *Hyponomeuta padellus*, 54; against *Earias insulana*, 102; against Lepidoptera, 103; susceptibility of *Epicampoptera strandi* to, 108; against *Thaumetopoea pityocampa*, 121; and captan, 167; wettable preparation of, ineffective against *Myzus persicae*; effect of spore preparation of, in sprays on arthropod fauna of apple orchard, 167; pathogenicity of different strains of, for *Galleria mellonella*, 178; commercial preparations of spores of, in sprays against *Cheimophila salicella*, 267; against *Achaea janata*, 318; commercial preparations of spores of, against insect pests of apples, vines and *Prunus*, 337; spore preparation of, against Lepidopterous larvae, 348; in sprays against apple pests, 360; commercial preparations of spores of, alone and with carbaryl, against Noctuids and *Myzus persicae*, 367; toxins of, susceptibility to, in termites, 371; in sprays against larvae of *Anomis sabulifera*; phagocytosis of, in larvae of *Pseudaletia unipuncta*, 372; susceptibility of *Porphyrosela minuta* to, 377; spore preparations of, against *Lymantria dispar*, 389; biological titration and bioassay of, 424, 425, 426; serotypes of, 425, 426; standardization of commercial spore preparations of, 426; toxins and activity of, in insects, 428; activity of proteolytic enzymes of *Pieris brassicae* on crystals of, 428, 429; study of thermostable soluble toxin in strains of, thermostable principles in commercial preparations of, and taxonomy and chemical properties of; titration methods and standardization of commercial preparation of, 429; bacterial preparations of, for insect control; susceptibility of species of stored-products moth larvae to; humidity affecting susceptibility of *Ephestia kuehniella* to; sprays of, against *Choristoneura murinana*; for control of *Hyphantria cunea*, 430; effect of irradiation on susceptibility of *Tribolium confusum* and *Tribolium castaneum* to, 431; against *Oxycaenus* spp., 484; use of, in insect control, 506; spore preparation of, against *Choristoneura murinana*, 563; effectiveness of commercial preparations of spores and endotoxin of, against larvae of *Galleria mellonella*, 566; commercial preparations of, delaying death of virus-infected larvae of *Malacosoma neustria*, 573; bioassay of exotoxin of, with *Drosophila melanogaster*, 598; against *Pandemis dume-tana*, 617; spores of, ineffective against *Neodiprion taedae linearis*, 643
- Bacillus thuringiensis alesti*, effect of, on honey bees, 428; infecting larvae of *Ephestia kuehniella*, 429
- Bacillus thuringiensis anduze*, enzymatic hydrolysis of crystals of, in *Pieris brassicae*, 428, 429
- Bacillus thuringiensis berliner*, isolated from *Lymantria dispar*, 428; enzymatic hydrolysis of crystals of, in *Pieris brassicae*; production of thermostable exotoxin by, 429; action of, on larvae of *Cydia pomonella* resembling that on *Ephestia kuehniella*, 430
- Bacillus thuringiensis dendrolimus*, isolated from *Lymantria dispar*; effect of, on honey bees, 428; standardization of, 429
- Bacillus thuringiensis euxoae*, effect of, on honey bees, 428
- Bacillus thuringiensis galleriae*, *Euproctis chrysorrhoea* susceptible to infection by, 89; spore preparations of, against *Lymantria dispar*, 389; rôle of intestinal microflora of *Pieris brassicae* and *Galleria mellonella* on development of infection caused by, 428; infecting larvae of *Ephestia kuehniella*, 429; commercial preparation of spores of, for control of insect pests of crops and plants, 430; combined use of *Trichogramma* egg-parasites and commercial preparation of, against cabbage pests, 432; with  $\gamma$ -BHC against *Sitotroga cerealella* and *Trichogramma cacoeciae*, 432, 433
- Bacillus thuringiensis sotto*, spore preparations of, against *Lymantria dispar*, 389; effect of, on honey bees, 428
- Bacillus thuringiensis thuringiensis*, determining rate of development of, 56; inhibitive effects of plant extracts on, 56; commercial preparation of, against Lepidoptera, 352; effect of, on honey bees, 428; isolation of and environmental conditions inactivating labile toxin produced by, 429; effects of temperature and water on viability and virulence of; comparative susceptibility of Lepidopterous larvae to commercial preparations of spores and crystals of; against moths in stored products, 430; attacking *Melolontha melolontha*, 430, 431; commercial preparation of spores of, against *Lymantria dispar*, 491, 492; application of, in capsule form against *Ostrinia nubilalis*, 492
- Bacteria, species of, as symbiont from eggs of *Macrosteles fascifrons*, 239; control of insects by, 240; control of, in fruit trees, 288; use of, against insects; infecting laboratory reared *Lymantria dispar*, 427; in intestine of larvae of *Thaumetopoea pityocampa*; selection of virulent forms of entomogenous, 342 (see also *Pseudomonas*, *Flavobacterium*, *Bacillus*)
- Bactospeine, commercial preparation of *Bacillus thuringiensis*, 102
- Bactra truculenta*, food-plant range of, introduced against nutgrass in Hawaii, 175
- Bactromyia aurulenta*, parasitising *Abraxas pantaria* on ash in Portugal, 294
- Bahamas, *Aleurocanthus woglumi* in, 172
- Baits, for *Rhynchophorus palmarum*, 42; for *Ceratitis capitata*, 53; for *Ceratitis* spp., 130; for *Nematocerus sulcatus* and *Aperitmetus brunneus*, 135; for Tipulid larvae, 329; for *Rhagoletis pomonella*, 352; for *Ceratitis capitata*, 376; for attracting insect pests, 399; for millepedes, 577; for *Dacus oleae*, 578; for *Pectinophora gossypiella*, 589
- Bakthane, spore preparation of *Bacillus thuringiensis*, 367



- Ballota nigra*, infected by *Ballota* split-leaf virus in Britain, 232
- Balsam Fir (see *Abies balsamea*)
- Bamboo, *Odonaspis secreta* on, in Japan, 87; Pyralid pests of, in Java, 178
- Banana, *Colaspis* sp. on, in Venezuela, 47; in diet for *Dacus oleae*, 52; *Nacoleia octasema* on, 177;  $\gamma$ -radiation as quarantine treatment of, 284; attractiveness of, to *Drosophila melanogaster*, 288; *Tetranychus cinnabarinus* on, in Lebanon, 337; pests of, in Somalia, 380; rust thrips on, 403; in diets for *Ceratitis capitata*, 409; attacked by *Lachnosterna plaei* in Guadeloupe, 560; *Ecpanteria icasia* on, in Costa Rica, 645
- Bangalow Palm (see *Archontophoenix alexandrae*)
- Banol (see Chlorxylam)
- Barathra (see *Mamestra*)
- Barbados, *Aleurocanthus woglumi* on *Citrus* in, 172
- Barbarea stricta*, *Aphis triglochis* in relation to, in Britain and Holland, 653
- Barbarea vulgaris*, *Aphis triglochis* in relation to, in Britain and Holland, 653
- Barbitistes fischeri*, predation by, not affected by dusts against *Thaumetopoea pityocampa* on pine in Spain, 127
- Barbituric Acid, effect of, on *Anthonomus grandis*, 277
- Bari (processed food product), insects infesting, in storage in India, 399
- Barichneumon bilunulatus*, effect of insecticide dusts on parasitism of *Bupalus piniarius* by, in Soviet Union, 190
- Barium Fluosilicate, in bran baits, against Tipulid larvae, 329
- Barium Polysulphide, in sprays against Coccids, 328; ineffective in sprays against *Trioza tremblayi*, 627
- Bark-beetles, laboratory tests of insecticides against, 54; factors affecting oviposition by, 65; seasonal development of, on elm in Soviet Union, 89; Hymenopterous parasites of, in California, 155; on fruit trees in Iran, 519
- Barley, pests of, in Soviet Union, 17; *Brachycolus noxius* on, in Turkey, 83; *Melolontha melolontha* on, in China, 89; harvest of, in relation to *Hyponomeuta padellus malinellus*, 97; *Haplodiplosis equestris* on, in Germany, 100; *Eurygaster integriceps* on, in West Pakistan, 145; *Nezara viridula* on, in Japan 151; *Agriphila straminella* on, in Britain, 231; fat content in relation to insecticide contamination of seeds of, 281; subterranean aphids in relation to yellow-dwarf virus of, in South Dakota, 292; *Lema melanopa* on, in Indiana, 307; *Rhopalosiphum fitchii* and *Rhopalosiphum padi* reared on, in Manitoba, 311; protection of, from pests in Soviet Union, 319; thrips on, in Holland, 341; Auchenorrhyncha and Heteroptera on, in Sweden, 345; *Haplodiplosis equestris* on, in Germany, 380; *Petrobia latens* on, in Queensland, 449; varietal susceptibility of, to *Chlorops pumilionis* and *Oscinella frit* in Rumania, 462; *Eurygaster integriceps* on, in Bulgaria, 554; resistance to *Lema melanopa* in, in Michigan, 582; transmission of barley yellow-dwarf virus to, by aphids, 631
- Barley Malt, in baits for millepedes, 577
- Barley (Stored), control of *Oryzaephilus surinamensis* in, in Britain, 255; determination of fenitrothion on, 296; *Amphibolus venator* preying on *Trogoderma granarium* in, in India, 476; *Aeroglyphus robustus* in, in Canada, 495
- Barthrin, guide to, 297
- Basudin (see Diazinon)
- Bathurin, spore-preparation of *Bacillus thuringiensis*, 8
- Bathycoelia ovalis*, on cacao in Nigeria, 627
- Bathyplectes curculionis*, reared from *Hypera variabilis* in Illinois, spread of, in United States, 168; parasitising larvae of *Hypera variabilis*, in Delaware and New Jersey, cocoon parasites of, 369; attacking *Hypera variabilis* in Iran, 570
- Battaristis vittella*, larvae of, as scavengers in pine cones in Arkansas, 303
- Baicaliotes*, g.n., in Ethiopia, 467
- Baycid (see Fenthion)
- Bayer S4400 (see O-Ethyl O-2,4,5-Trichlorophenyl Ethylphosphonothioate)
- Bayer S4706 (see O-Ethyl S-p-Methylphenyl Ethylphosphonodithioate)
- Bayer 5024 (see Methiocarb)
- Bayer 5024a (see Methiocarb)
- Bayer 5080 (see Aminocarb)
- Bayer 5080a (see Aminocarb)
- Bayer 25141 (see Fensulfothion)
- Bayer 29493 (see Fenthion)
- Bayer 36205 (see Quinomethionate)
- Bayer 37289 (see O-Ethyl O,2,4,5-Trichlorophenyl Ethylphosphonothioate)
- Bayer 37344 (see Methiocarb)
- Bayer 38156 (see O-Ethyl S-p-Methylphenyl Ethylphosphonodithioate)
- Bayer S767 (see Fensulfothion)
- Bayer 38920 (see 6,7,8,9,10,10-Hexachloro-1,5,5a,6,9,9a-hexahydro-3-methyl-6, 9-methano-2,4-benzodioxepin)
- Bayer 39007 (see Arprocarb)
- Bayer 41831 (see Fenitrothion)
- Bayer 44646 (see Aminocarb)
- Baygon (see Arprocarb)
- Bean, Azuki (see *Phaseolus aureus*)
- Bean, Broad, *Sitophilus granarius* not breeding in stored, 5; effect of, on populations of *Oscinella frit*, 13; nutritional value of, to *Aphis fabae*, 79; Thysanoptera on, in Britain, 79; *Macrosiphum pisum* on, 82; relationship of *Aphis craccivora* to mosaic virus of, in India, 259; *Matsumuraesia phaseoli* on, in China, 264; *Diabrotica undecimpunctata undecimpunctata* reared on, 285; effect of, on growth of *Aphis fabae*, 291; *Myzus persicae* as vector of mosaic virus in, 324; rearing aphids on, in Germany, 341; use of, in tests of virus transmission by *Macrosiphum* spp., in Germany, 381; incidence of bean leaf-roll virus in varieties of, in Britain, 385; *Ocnogyna baetica* on, in Tunisia, 393; *Sitona* spp. on, in Israel, 447; aphids on, in Czechoslovakia, 455; *Aphis gossypii* on, in France, 457; wing development of *Aphis craccivora*

- on, 598; *Lixus algerus* on, in Sicily, 606; *Sitona* on, in Israel, 612; histological function of feeding puncture of *Aphis fabae* on, 621
- Bean, Cluster (see *Cyamopsis tetragonoloba*)
- Bean, Dwarf, effects of soil applications of DDT and aldrin on, 231
- Bean, Lima (see Lima Bean)
- Bean, Snap (see Snap Bean)
- Bean, Soy (see Soy Bean)
- Bean, String, dimethyl 1-dimethyl-carbamoyl-1-propen-2-yl phosphate residues in, 240
- Beans, aphids and virus diseases of, 26; *Hylemya trichodactyla* on, in Ontario, 43; as food for *Euschistus conspersus*, 63; infected by virus disease of artichokes, 107; insecticide residues on, 137; *Acanthoscelides obtectus* on, in Poland, 139; differing suitability of, for *Callosobruchus chinensis* and *Zabrotes subfasciatus*, 150; *Nezara viridula* on, in Japan, 151; insects on, 160; *Tetranychus cinnabarinus* reared on, 164; *Callosobruchus maculatus* on, in China, 264; damage to, by insecticides, 269; *Tetranychus pacificus* on, in California, 269; fecundity of *Tetranychus telarius* in relation to nutrition of, 274; viruses of, transmitted by *Bemisia tabaci* in Brazil, 300; protection of, from pests in Soviet Union, 319; *Tetranychus telarius* on, in Soviet Union, 320; *Tetranychus telarius* on, 353, 357; chloropicrin residues in, after chamber fumigation, 375; pests of, in Tanganyika, 394; *Sitona* spp. damaging, in Soviet Union, seed treatments for, 550; *Tetranychus dianthus* on, in Germany, 522; low-volume aerial treatment of, against *Heliothis armigera* and *Acanthomia horrida* in Tanganyika, 530; varietal resistance of, to *Epilachna varivestis* in North Carolina, 586; *Macrosiphum pismum* on, in relation to predators, 646
- Beans, Stored, *Acanthoscelides obtectus* in, in Poland, 139; piperonyl butoxide residues in, following paper bag treatment, 487; population dynamics of *Acanthoscelides obtectus* in, 573; insecticide contamination of, through package material, 582
- Bear, DDT residues in, in U.S.A., 641
- Beauveria, attacking *Hardya anatolica*, 136; *Aradus cinnamomeus* parasitised by, in Czechoslovakia, 454; infection of *Orthezia praelonga* by, in Brazil, 461; attacking *Coleophora laricella*, 525
- Beauveria bassiana, alone and with DDT, against *Leptinotarsa decemlineata*, 15; infesting *Neodiprion pratti pratti*, 34; infesting *Vitacea polistiformis* on vines in Missouri, 160; attacking *Hypera variabilis* in New York, 296; transmission of, by *Tyrophagus putrescentiae* to *Galleria mellonella* in Czechoslovakia, 345; for control of agricultural and forest pests in Czechoslovakia; protective activity in cuticle of *Eurygaster integriceps* against, 428; increasing virulence of, mode of action of DDT and against *Leptinotarsa decemlineata*, 432; effect of, on fecundity and diapause of *Leptinotarsa decemlineata*, 433; use of, alone or with DDT, against *Leptinotarsa decemlineata*, 555; infecting *Ecantheria icasia*, 645
- Beauveria globulifera, use of, alone or with DDT, against *Leptinotarsa decemlineata*, 555
- Beauveria rileyi, isolated from *Trichoplusia ni* in Indiana, 537
- Beauveria tenella, *Melolontha melolontha*, artificially infected with, in France, 120
- Beech, *Rhynchaenus fagi* on, in France, 53; treatment of timber of, against termites, 408; *Camponotus* ants on, in Germany, 456; effect of osmotic pressure of sap of, on development of insects, 576; damaged by *Rhynchaenus fagi* in Germany, 658 (see also *Fagus sylvatica*)
- Bee Hives, *Galleria mellonella* as pest of, 566
- Bee-keeping, 196; in India, 316
- Beer, Bantu, question of tainting of, by treatment of sorghum with pyrethrins, 82
- Bees, toxicity of insecticides to, 9; population studies of, 247; associated with safflower in Arizona, 524; as pollinators, 525
- Bees, Bumble (see *Bombus*)
- Bees, Honey, effects of insecticides on, 29; in relation to pollination of cantaloup melons in Arizona, 38; effect of insecticides on, 40; pollinating groundnuts in Georgia, 45; Lachnids as source of honeydew for, 99; toxicity of, O,O-diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate to, 160; pollinating lucerne in Czechoslovakia, 178; evaluation of chemicals as attractants and repellents for, 180; effect of thiono substituent on toxicity of fluorophosphates to, 188; selectivity of phosphorus insecticides in relation to toxicity to, 240; effect on, of insecticide contamination of hives, 247; population studies of, 247; visit numbers of, and watermelon pollination by, 296; natural enemies of, in Rhodesia, 394; effect of *Bacillus thuringiensis* on, 428; Conopids causing myiasis of, in Soviet Union, 437; pollination of red clover by, in Britain, 523; habits and senses of, 525; *Varroa jacobsoni* on, in Soviet Union; Conopid parasite of, in South Africa, 534; collecting red lead paint in Sicily, 610; attacked by *Lytta vesicatoria*, 611
- Bees, Wild, pollinating groundnuts in Georgia, 45 (see also *Megachile*)
- Beeswax, apples used in rearing *Conotrachelus nenuphar* treated with, 286
- Beet, *Tanyemecus dilaticollis* on, in Yugoslavia, 6; *Agrotis segetum* on, in Soviet Union, 16; experiments with *Piesma quadratum* as vector of virus disease of, 59; virus disease of, in California, 71; aphids on, in Britain, 80; *Melolontha melolontha* on, in China, 89; metabolism of dimethoate in, 92; pests of, in Poland, 97; predation of *Coccinella septempunctata* on *Aphis fabae* on, in Czechoslovakia, 137; *Aphis fabae* on, in Poland, 140; survival of *Heterographis fulvobasella* on, 165; damaged by Coleoptera in Soviet Union, 194; *Pegomya betae* on, in Soviet Union, 194; predators of aphids on, in Soviet Union, 196; *Chaetocnema* spp. on, in Bulgaria, 197; *Pegomya betae* on, in France, 224; *Cnephiasia virgaureana* on, in France, 226; aphid sampling in, in Britain, 229; uptake of  $^{32}\text{P}$  from, by aphid vectors of yellows virus in Belgium, 229; attacked by



- Lixus* spp. in Spain, 246; *Aphis fabae* on, in Soviet Union, 321; aphids as vectors of viruses in, in Britain, 335; viruses and vectors on, in Germany, 338; aphids on, in Britain, 384; effect of insecticide treatment of, on incidence of aphids and virus yellows in Britain, 386; *Xylella exoleta* on, in Tunisia, 393; effects of insecticides on, against *Scrobipalpa ocellatella* and *Cleonus punctiventris* in Rumania, 461; aphids and virus disease of, in Britain, 446; spread of yellows viruses in, transmitted by *Myzus persicae* and *Aphis fabae* in Britain, 505; control of yellows virus disease of, in Britain, 507; *Aphis fabae* on, in Poland, effect of disulfoton granules on, 513; seed treatments for, against *Atomaria linearis* in Czechoslovakia, 516; control of *Aphis fabae* reducing transmission of viruses to, 516; pests of, in Iran, 519; *Pegomya betae* and *Aphis fabae* damaging in Soviet Union, 551; *Stethorus punctillum* predacious on *Tetranychus cinnabarinus* on, in Israel, 558; population fluctuations of *Aphis fabae* on, in Germany, 564; growing points of, attacked by *Cnephasia longana* in Holland, 568; effect of disulfoton granules on yield of, against aphids in Switzerland, 577; estimating populations of *Blaniulus guttulatus* and *Archiboreoiulus pallidus* on, in Belgium, 577; artificial conversion of *Piesma quadratum* into vector of crinkle virus of, 600; resistant strain of *Myzus persicae* on, in Sweden, 650; *Piesma quadratum* and other insects in relation to crinkle virus of, 657
- Beetles, as predators of Tipulid larvae, 329
- Behenic Acid, methyl esters of, inhibiting growth of *Gryllobius sigillatus*, 605
- Belgium, *Myzus persicae* and *Aphis fabae* on beet in, 229; evaluating damage by leaf-miners to chicory in the forcing bed in, 575; *Hylemya brassicae* on crucifers in; *Hylemya nudibasis* sp.n. in, 575; development of *Rhizococcus cacticans* on roots of *Aechmea fasciata* in, 576; studies on cutworm populations in, 576; *Blaniulus guttulatus* and *Archiboreoiulus pallidus* on beet in, 577
- Bembidion lampros*, egg consumption by, in laboratory prey-density experiments with eggs of *Musca domestica*; predacious on eggs of *Hylemya brassicae* in Holland, 576
- Bembidion ustulatum*, egg consumption by, in laboratory prey-density experiments with eggs of *Musca domestica*; predacious on eggs of *Hylemya brassicae* in Holland, 576
- Bemisia*, transmission of leaf-curl disease of tobacco by, in Philippines, 480
- Bemisia tabaci*, insecticides against, on cotton in India, 215; not transmitting mosaic virus of *Cajanus cajan* in India, 217; as vector of cucumber vein-yellowing virus in Israel, 237; hairiness of cotton favouring populations of, in Sudan, 258; diseases of bean plants transmitted by, in Brazil, 300; transmission of virus by, on cotton in Central America, 401; populations of, on hairy varieties of cotton in the Sudan, 475; transmitting viruses to tomato and other plants in Sudan, 505; effect of, on cotton in Sudan Gezira, 624
- Benincasa cerifera*, as ingredient in processed food bari, 399
- Benzene Hexachloride (see BHC)
- Benzene, and BHC, 86; use of, in extraction of malathion residues from fruits, 187; as solvent for sex attractant of *Pectinophora gossypiella*, 500
- Benzyl Benzoate, as attractant for *Rhynchosiphorus palmarum*, 42
- Berberis thunbergii*, *Eulecanium persicae* on, in Ontario, 203
- Bermuda Grass (see *Cynodon dactylon*)
- Berries, carbaryl residues on, 186
- Besbicus mirabilis*, *Syrnergus pacificus* in galls of, on *Quercus garryana* in British Columbia, 179
- Beskea*, attacking *Oebalus poecilus* on rice in British Guiana, 171
- Bessa harveyi*, influence of health of host food-plant in host finding by, 21
- Bessa selecta*, parasitising *Pristiphora abietina* on spruce in Germany, 566
- Bestiola mira*, parasitising *Odonaspis secreta* in Japan, 87
- Beta Virus 3, artificially induced transmission of, by *Piesma quadratum*, 600
- Betaine, repellent to *Eurytoma roddi*, 57
- Betel (see *Piper betle*)
- Betula verrucosa*, chemical decomposition of, by termites, 406
- BHC (including  $\gamma$  isomer of, except where otherwise stated), resistance to, in beetles, 3; resistance to, in *Sitophilus* spp., 4; against *Oberea oculata*, 6; against *Hoplocampa* spp., 9; against *Hypera variabilis*, 36; treatment of pine slash with, against *Ips confusus*, 41; against *Hylemya trichodactyla*, 43; persistence of, in soil, 45; against *Chilo suppressalis*, 48; against *Leptinotarsa decemlineata*, 52; against *Hyponomeuta padellus*; alone or with dieldrin; toxicity of, to *Drosophila melanogaster* and *Tribolium castaneum*, 54; resistance of *Distantiella theobroma* to, 72; against stored-products pests, 77; susceptibility of *Dermestes* to, 78; toxicity of, to fish, 80; against Diptera, flushing of mushrooms retarded by, 81; against *Macrosiphum pisum*, 82; toxicity of, to *Spodoptera littoralis*, 84; against *Lachnosterna*, 85; tests of, with benzene and Triton B-1956, against *Spodoptera litura*, 86; use of, in formulation with fungicide, against *Zabrus tenebrioides*; in soil and seed treatment against wireworms, 90; alone or with other insecticides, against *Tychius flavus*, 91; against *Thysanoptera*, 102; seed treatment with, 105; contamination with, in stored grain, 133; in dusts against insect pests of cotton; soil, treatment with, and in baits against *Nematocerus sulcatus* and *Aperitmetus brunneus*, 134; residues of, in plants, 137; seed treatment with, in dusts against rice pests, 141; in sprays against *Myzus persicae* and *Aphis gossypii*, 146; soil application of, against *Chilo suppressalis*, 147; and fertilisers, 147; seed treatments with, against *Lissorhoptrus oryzophilus*, 161; toxicity of, to cyclodiene-susceptible and cyclodiene-resistant strains of *Hylemya antiqua*, 163; electron affinity and animal toxicity of

isomers of, **180**; in dusts against *Bupalus piniarius*, **190**; in dusts against *Pegomya betae*, **194**; and DDT, **198**; in dusts against *Salebria semirubella sanguinella*; against *Chaetocnema* spp., **198**; against *Elasmopalpus lignosellus*, **206**; with DDT, in sprays against *Spodoptera littoralis*, **213**; in dusts against *Amsacta moorei*, **214**; treatment of outer surfaces of bagged foodstuffs with, against insect infestations, **215**; toxicity of, to *Heterotermes indicola*, **216**; toxicity of, to *Tribolium castaneum* and *Sitophilus oryzae*; in dusts against *Hymenya recurvalis*, **217**; in dusts against *Leguminivora glycinivorella*, **220**; in sprays against *Nausinoe geometralis*, **220**; in granules against *Ostrinia nubilalis* and *Proceras venosatus*, **221**; in baits against *Heteronychus arator*, **222**; susceptibility of grain beetles to, **225**; in sprays and baits, not successful against *Melanogryllus desertus*, **227**; in sprays against *Enarmonia formosana*, **230**; effect of, on coffee beverage, **241**; soil treatment with, in dusts against *Cyrtomenus mirabilis*, **242**; in dusts against *Oxycaenus hyalinipennis*, **243**; stem and root treatment with, against *Anthores leuconotus*, **245**; trunk treatment with, in sprays against *Coraebus undatus*, **255**; toxicity of, to *Amsacta moorei*, **259**; persistence of spray residues of, on *Solanum melongena*; persistence on *Hibiscus* of spray residues of, against *Earias fabia*; in dusts against *Pseudaletia unipuncta*, **260**; toxicity of, to *Sitophilus oryzae*; toxicity of, to *Tribolium castaneum*, **261**; in spray and dust against *Chilo partellus*; applied to seed furrow against *Atherigona indica*, affecting germination of sorghum, **262**; against *Agrotis ipsilon* and *A. segetum*, **264**; in sprays against *Nola distributa*, **265**; topical and soil applications of, against *Eleodes suturalis*, **270**; injector for dusts of, against *Azteca paraensis*, **287**; presence of, in rainwater in England, **298**; in sprays, against *Lema melanopa*, **302**; against *Musgraveia sulciventris*, **314**; mechanism of resistance to, in *Musca domestica vicina*, **315**; toxicity of, to adults and larvae of *Dacus cucurbitae*, **316**; stomach toxicity of, to hoppers of *Schistocerca gregaria*, **317**; in dusts, against *Achaea janata*, **318**; in granules, against *Sitona* spp., **321**; in dusts, against *Oscinella frit*; in dusts, against beetles injurious to lucerne, **323**; in dusts, against *Otiorynchus* spp., **326**; in dusts, soil treatment with, against Tipulid larvae, **329**; in sprays, against *Heterarthrus ochropodus*, **331**; against *Sahlbergella singularis*, resistance to, in *Distantiella theobroma*, **333**; and DDT in sprays against insect pests of apple, vines and *Prunus*, **337**; against *Psylliodes chryscephalus*, and *Ceutorhynchus pleurostigma*, ineffective against *Phytomyza rufipes*, **339**; adhesives used in seed treatment with, reducing germination, **344**; in sprays, against *Dendroctonus frontalis*, **370**; effectiveness of, in stored pine sapwood against termites, **408**; alone and with aldrin or heptachlor, soil treatments with, tolerance of larvae of *Nemocestes incomptus* to, **422**; combined with *Bacillus thuringiensis galleriae* against

*Sitotroga cerealella* and *Trichogramma cacoeciae*, **432**; effective in sprays against *Aporia crataegi*, **439**; in dusts against *Galerucella birmanica*, **440**; in sprays against *Echinocnemus oryzae*, **441**; in dusts against *Sitotroga cerealella* in maize stored in cribs; alone and with DDT, effect of, against cotton pests, on crop yields, **442**; against *Rhynchaenus fagi*, **456**; factors affecting efficiency of, in soil or seed treatments against crop pests, **461**; in dips against *Psila rosae*, **469**; in sprays against *Panonychus ulmi*, not affecting *Blepharidopterus angulatus*, **470**; toxicity of, in sprays, to predacious insects; in sprays against *Typhlodromus pyri*, **471**; with DDT or fenthion, in sprays against maize borers, **472**; and DDT, effect of, in sprays against cotton worms, on populations of spider mites, **474**; comparative effectiveness of, as smoke or dust against *Ephestia* spp., weevils and other stored product pests, **476**; in aerosols against *Pyrilla perpusilla*, **478**; against termites and *Chilo infuscatellus*, **479**; in dusts and soil treatment with, against *Andraca bipunctata*, **482**; in sprays against *Eurydema ornatum chloroticum*; in sprays against *Athalia rosae ruficornis*, **483**; resistance to, in *Hylemya brassicae*, **493**; against *Chilo suppressalis*, toxicity of, to freshwater fish; in sprays against *Plagiostrochus suberi*, **494**; soil treatment with, and in dusts, against *Hylemya* spp., **511**; dusting and spraying surface of soil with, against *Contarinia medicaginis*, **512**; with chlorinated turpentine, aerosols of, against *Leptinotarsa decemlineata*, **514**; alone and with thiram, seed treatment with, in dusts against *Atomaria linearis*, **516**; preplanting treatment with, against *Hyllobius abietis*; effects of soil treatments with, on soil microfauna, against larvae of *Melolontha*, **517**; against *Chilo polychrysa*, **527**; seed treatments with, in dusts against *Sitona* spp., **550**; in dusts against *Aphis fabae*, **551**; soil treatment with, against *Hylemya* spp., and effect of, on cabbage; in dusts against *Apion* and *Sitona*, **552**; soil treatment with, in dusts against *Argyresthia ephippella*, **553**; seed treatment with, against *Eurytoma onobrychidis* and *Bruchidius unicolor*, **554**; in dusts against *Phyllotreta cruciferae*, **555**; in sprays against *Cladius pectinicornis*; against *Collicularia microgrammana*, **556**; in dusts against woodlice, **564**; applied in aerosols and sprays; sexually controlled differences in susceptibility of *Melolontha hippocastani* and *Otiorynchus niger* to, **565**; as wettable powders, against *Hypera variabilis*, **570**; soil treatment with, against *Strategus aloeus*, **577**; and DDT, contamination of packaged foodstuffs from, in aerosols, **582**; against *Lasioderma serricorne*, **583**; persistence of, in soil for control of subterranean termites; bioassay of, using *Coptotermes formosanus*, **587**; in sprays against pests of cowpea, **605**; in sprays against *Lixus algirus*, **606**; in dusts against *Epilachna chrysomelina*, **609**; against *Tropinota squalida* and *Epicometis hirta*, **610**; in dusts against *Lyta vesicatoria* and *Omphilus lepturoides*, **611**; tests of, against



- Phthorimaea operculella*, **613**; alone and with parathion or phosphamidon, in dusts against ants associated with *Planococcus lilacinus*, **614**; for protection of freshly felled timber in storage against insect borers and subterranean termites, **615**; residues of, in atmospheric environment; effects of grain treated with, on breeding pheasants, **618**; persistence of deposits of, used in sprays against stored-product beetles, **622**; with DDT, in dusts against *Dysdercus* spp., **624**; tests for resistance to, in *Sahlbergella singularis* and *Distantiella theobroma*; in sprays against *Sahlbergella singularis* and other Mirids, **626**; in dusts against *Trioxa tremblayi*, **627**; in aerosols and sprays against *Adelges nordmannianae*, **632**; seed and soil treatment with, in dusts against wireworms; in dusts against *Oscinella* spp.; with DDT and sodium fluosilicate, in dusts against *Phyllotreta vittula*, **633**; against *Lema melanopa*, **641**; development of resistance to, in *Psylla pyricola*, **643**; effect of, on blood cells of *Periplaneta americana* and *Poecilocus pictus* treated topically and *Samia cynthia ricini* treated by injection, **662**; in sprays against *Aleurolobus barodensis*, **664**
- Bhindi (see *Hibiscus esculentus*)
- Biammonium Phosphate, use of, in traps for *Ceratitis capitata*, **53**
- Bibliography, on biological control, **180**; of Hymenoptera in Philippines, **463**; of *Hypera variabilis*, **463**; of entomological terminology, **572**; of virus diseases and mealybug vectors, **572**; of Mirids and Heteroptera associated with cacao, **572**
- Bidrin (see Dimethyl 1-Dimethylcarbamoyl-1-propen-2-yl Phosphate)
- Bilbeny (see *Vaccinium*)
- Binapacryl, against *Panonychus ulmi*, **26**; in sprays against *Tetranychus telarius*, **230**; phytotoxicity of, on plants, **230**; in sprays against *Panonychus ulmi*, **284**; in sprays against *Oligonychus coffeae* and *Calacarus carinatus*, **398**
- Bioassay, methods of, **28**; of sex-pheromone activity, **61**; of insecticides, **83**, **93**; rearing of *Hylemya brassicae* for, **154**; of plant attractants for *Anthonomus grandis*, **286**; statistical method in, **297**; of insecticides, **317**, **344**; of *Bacillus thuringiensis*, **424**, **425**, **426**; of insecticides, **473**, **587**; of exotoxin of *Bacillus thuringiensis* with *Drosophila melanogaster*, **598**
- Biochemistry, Insect, aspects of, **297**
- Biological Assay, statistical method in, **297**
- Biological Control, book on, **3**; of noxious plants, **62**; integration of chemical control with, **121**
- Biological Tests, improved tube closure for, **524**
- Biolyssa tristis*, parasitising *Hypera punctata* in U.S.A., **364**; *Gelis* sp. in, in New Jersey, **369**
- Biospor, spore preparation of *Bacillus thuringiensis*, **563**
- Biospor Spritzpulver 2802, preparation of spores of *Bacillus thuringiensis*, **54**; spore preparation of *Bacillus thuringiensis*, **566**
- Biotin, attractiveness of, to *Eurytoma roddi*, **57**; effect of, on reproduction and longevity of *Anastrepha ludens*, **413**
- Biotrol BTB, spore preparation of *Bacillus thuringiensis*, **566**
- Birch (see also *Betula verrucosa*)
- Birch, *Camponotus* ants on, in Germany, **456**
- Birds (see also individual birds) predacious on Bruchids, **5**; effect of, on insects and spiders in oak forest in Germany, **126**; preying on *Vitacea polistiformis*, **160**; preying on Lepidopterous pests of rice in British Guiana, **172**; preying on *Archips crataeganus* on oak in Czechoslovakia, **199**; toxicity of insecticides to, in U.S.A., **248**; as predators of *Zeadiatraea grandiosella* and *Ostrinia nubilalis*, **302**; predacious on *Musgraveia sulciventris* in New South Wales and Queensland, **314**; as predators of Tipulid larvae, **329**; destroying *Didymuria violescens*, **396**, **397**; organochlorine residues in, **400**; encouragement of, in areas where *Tortrix viridana* is injurious to oak, **523**; attacking *Coleophora laricella*, **525**, **526**; attacking *Eucosma tedella*, **564**; *Rhagoletis cerasi* attacked by, **617**
- Bixadus sierricola*, control of, on coffee in Angola, **245**
- Blackberry, *Hartigia nigra* on, in Holland, **382**; *Trioxa tripunctata* on, in Florida, **649**
- Blackbird (see *Agelaius*)
- Blackthorn (see *Prunus spinosa*)
- Bladafum (see Sulfotep)
- Blaniulus guttulatus*, tests of insecticides against; traps for estimating populations of, on beet in Belgium, **577**
- Blastothrix confusa*, adaption of, to bionomics of *Eulecanium corni* in Soviet Union, **142**
- Blattella germanica*, metabolism of thiotepe in, **39**
- Blepharidopterus angulatus*, effect of sprays against *Panonychus ulmi* on, in Britain, **470**; toxicity of insecticide sprays to, in Britain; cannibalism affecting mortality of, on apple in Britain, **471**
- Blissus gibbus*, infesting sugarcane in India, **664**
- Blissus leucopterus*, chemical control of, on maize in Ohio, **499**; on *Digitaria decumbens* in British Guiana, **638**
- Blondelia inclusa*, parasitising *Neodiprion sertifer* on pine in Czechoslovakia, **200**
- Blondelia nigripes*, effect of insecticide dusts on parasitism by, in *Bupalus piniarius* in Soviet Union, **190**
- Blood, analytical method for insecticides in; gas-chromatographic measurement of toxaphene in, **464**
- Blueberry, *Cheimophila salicella* on, in British Columbia, **267**; *Rhagoletis pomonella* on, in Michigan, **301**, **352**; *Chlamisus cribripennis* on, in Nova Scotia, **581**
- Bluegrass (see *Poa pratensis*)
- Blue Spruce (see *Picea pungens*)
- Boarmia bistortata*, *B. crepuscularia* distinguished from, **140**
- Boarmia crepuscularia*, distinguished from *B. bistortata*, infesting forests in Soviet Union, **140**

- Bombus*, use of, for pollination of *Trifolium pratense* and lucerne, **184**; pollination of red clover by, in Britain, **523**
- Bomyl (see Dimethyl 1,3-Di(methoxycarbonyl)-1-propen-2-yl Phosphate)
- Bombyliids, work on, in Soviet Union, **549**
- Bombyx mori*, *Bacillus thuringiensis* against, on mulberry in Iraq, **103**; *Pyemotes ventricosus* in cocoons of, in India, **261**; *Nosema bombycis* transmitted by *Sancassania* to, in Czechoslovakia, **345**; toxicity of sprayed mulberry leaves to, in Brazil, **377**; lipids in haemolymph of, during course of nucleopolyhedrosis, **572**
- Bonnetia comta*, bionomics of, parasitising *Agrotis* spp. and parasitised by *Trichopria* sp., in China, **220**
- Bordeaux Mixture, in sprays against *Acrocercops cramerella*, **481**; and insecticides against *Xylosandrus compactus*, **615**
- Boron, in mixture against termite attack on beech and pine, **408**
- Borrelinavirus*, infecting *Malacosoma neustria*, **124**; *Pseudaletia* larvae killed by nuclear polyhedrosis caused by, **350**; transovarian transmission of, in insects, **431**; aerial dispersion of, against *Neodiprion swainei* in Canada, **432**; infecting *Pseudaletia separata* and *Heliothis assulta*, **439**; infecting *Rachiplusia ou*, **535**
- Borrelinavirus galleriae*, virus particles of, infecting *Galleria mellonella*, **120**
- Borrelinavirus luteopallens*, effect of, on *Aletta oxygala*, **50**
- Borrelinavirus mamestrae* sp.n., in *Mamestra brassicae* in Czechoslovakia, **431**
- Borrelinavirus reprimens*, polyhedra of, **373**
- Borrelinavirus swainei*, effect of, on *Neodiprion swainei*, **50**
- Borrelinavirus viminalis*, effect of, on *Trichio-campus viminalis*, **50**
- Botrytis eriophytis* (see *Paecilomyces*)
- Boverin, commercial preparation of *Beauveria bassiana* (q.v.), **15**
- BPS 50 (mixture of diphenylmethane and propiophenone), not improving residual action of pyrethrins, **225**
- Brachycolus noxius*, on cereals in Turkey, tests of insecticides against, **83**
- Brachyderes incanus*, infesting pine in Germany, **237**
- Brachymeria*, parasitising *Elymnias caudata* in India, **664**
- Brachymeria obscurata*, *Nausinoe geometralis* parasitised by, in China, **221**; parasitising *Aporia crataegi* in China, **439**
- Bracon*, parasitising *Lixus scabricollis* in Spain, **246**
- Bracon brevicornis*, parasitising *Earias insulana*, **103**; for bioassay of malathion residues, in India, **317**
- Bracon greeni*, parasitism of *Microlarinus lareynii* by, in India, **170**
- Bracon hebetor*, release of, against *Nacoleia octasema* on banana, in Fiji, **177**; new hosts of, in India, **343**; effect of venom of, on respiration of *Galleria mellonella*, **620**
- Bracon mellitor*, infection of, by *Mattesia grandis*, **648**
- Bran, insecticide residues in, **41**; in baits for Tipulid larvae, **329**; *Lasioderma serricorne* recovered from bags of, **422**; in baits, for *Oncopera* spp., **484**
- Brassica juncea*, oesophageal and stomach inclusions of aphids feeding on, **600**
- Brassica pekinensis*, *Brevicoryne brassicae* and mosaic virus disease of, in China, **222**; varietal resistance to insect attack in, in Wisconsin, **275**
- Braula coeca*, attacking hive bees in Rhodesia, **394**
- Brazil, *Apate* spp. introduced into, **56**; *Liriomyza langei* misidentified as *L. bryoniae* in, **112**; ecology of fruit flies in; *Cyrtomenus mirabilis* on groundnut in, **241**; *Prorops nasuta* controlling *Hypothenemus hampei* in; effect of systemic insecticides on cottonseed in; *Hypocala andremona* on persimmon in, **242**; pests of peach in; *Alabama argillacea* on cotton in, **243**; *Azteca paraensis bondari* damaging cacao in, **287**; *Ganaspis pelleranoi* parasitising *Lonchaea* and *Anastrepha* spp. in, **288**; *Quesada gigas* on coffee in, **299**; *Hypothenemus hampei* on coffee in; diseases of bean plants transmitted by *Bemisia tabaci* in, **300**; *Frankliniella fusca* on groundnuts in, **376**; agricultural pests and methods of control in; *Parlatoria cinerea* on orange in; *Bombyx mori* feeding on mulberry leaves in, **377**; *Cerococcus catenarius* on coffee in, **403**; *Orthezia praelonga* infected by fungi on *Citrus* in, **461**; *Strategus jugurtha* on coconut in, **577**; *Phyrdenus muriceus* on potato, in **639**; *Hypocala andremona* on persimmon in, **639**
- Breadfruit (see *Artocarpus*)
- Brestan (see Fentin Acetate)
- Brevicoryne brassicae*, on cabbage in Wisconsin, **66**; transmitting virus disease of cauliflower, **106**; infesting crucifers in Poland, **139**; associated with mosaic virus disease of *Brassica pekinensis* in China, **222**; varietal resistance to, in rape in Tasmania, **266**; varietal resistance in cabbage to, in Wisconsin, **275**; environmental factors affecting heterogonic cycle of, in Italy, **332**; *Diaeretiella rapae* parasitic in, in Chile, **377**; granular systemic insecticides against, on cabbage in Texas, **414**; factors influencing development of winged forms in, in Japan, **438**; reared on leaf disks for ecological studies, **451**; corpus allatum and form determination in, **466**; factors affecting reproductive rates of, on brussels sprouts in Britain, **506**; effect of temperature starvation and crowding on production of alates by, **598**
- Brevipalpus californicus*, bionomics and control of, on *Citrus* in Portugal, **386**; effect of insecticides and acaricides on, on cotton in Egypt, **474**
- Brevipalpus chilensis*, bionomics of, on apple in Chile, **47**
- Brevipalpus obovatus*, on *Citrus* in Venezuela, **287**; in relation to diseases of *Citrus* in Argentina, **376**; on flowers and ornamental plants in Germany, **518**



- Brevipalpus phoenicis*, on *Citrus* in Venezuela, 287; bionomics and control of, on *Citrus* in Portugal, 386; infesting tea in India, 663
- Brinjal (see *Solanum melongena*)
- Britain, *Pieris brassicae* in, 48; *Aceria hippocastani* on *Aesculus hippocastanum* in, *Eriophyes padi* on plum in; *Panonychus ulmi* on apple in, 49; *Dasyneura tetensi* on black currant in, 54; *Cydia pomonella* on apple in, 75; pests of stored products in, 77; Thysanoptera in, 79; annual usage of chlorinated-hydrocarbon insecticides in; aphids on beet in; *Hylemya brassicae* on cauliflower and swede in; *Psila rosae* on carrot in; wireworms on wheat in, 80; *Liriomyza bryoniae* on tomato in glasshouses in, 112; *Anobium punctatum* on Sitka spruce in, 181; aphid sampling in sugar-beet in; *Enarmonia formosana* on apple in, 229; pests of brussels sprouts in; *Tetranychus telarius* on cucumber in; *Agriphila straminea* attacking cereals in, 230; *Plutella maculipennis* on cauliflower in; phytotoxicity of DDT and aldrin applied to soil against vegetable pests in, 231; new records of leafhopper-borne plant viruses in; *Tetranychus telarius* on strawberry in, 232; low altitude flight of *Oscinella frit* in, 233; *Phytoseiulus persimilis* controlling *Tetranychus telarius* on cucumber in, 236; *Oryzaephilus surinamensis* in stored barley in, 255; non-stable resistance to demeton-methyl in *Myzus persicae* in, 291; organochlorine insecticides in rainwater in, 298; pests and virus diseases of beet in, determining original food plants of aphids in, effect of windbreak on aerial density of insects and spiders in, *Pemphigus bursarius* on lettuce in, beetle predators and number of *Hylemya brassicae* attacking brassica crops in, 335; new aphid-borne virus of *Trifolium repens* in, 336; aphids on sugar-beet and weeds in, 384; *Cecidophyopsis ribis* infesting black currant in, virus disease of beans in, 385; *Hylemya coarctata* on wheat in, *Hylemya brassicae* on cruciferous vegetables in, *Steneotarsonemus laticeps* on *Narcissus* in and aphids on sugarbeet in, 386; use of scents for attracting insect pests of vegetable and fruit crops in, 399; organochlorine residues in *Falco* spp., and pigeons in, 400; aphids and virus disease of beet in, 446; effect of low rainfall on populations of *Tipula paludosa* in, 467; *Oscinella frit* and its natural enemies in, 467; temperature under insect emergence traps in, 468; control of aphids and virus diseases of potato in; dieldrin sprays controlling *Euleia heraclei* and control of *Psila rosae* on celery in, 469; control of *Steneotarsonemus laticeps* on forced narcissus in, control of black currant reversion virus and *Cecidophyopsis ribis* in, control of *Eucosma uddmanniana* on loganberry in, effect of spray programmes on *Panonychus ulmi* and predators on apple in, 470; toxicity of orchard insecticides to predatory insects in, *Blepharidopterus angulatus* on apple in, *Typhlodromus pyri* on apple in, 471, 472; *Cryptolestes turcicus* in machinery of flour mill in, 504; control of *Ephestia kuehniella* in provender mill in, 505; symposium on integrated control of insect pests in, 506; pollination of red clover by bees in, 523; *Contarinia nasturtii* in, 529; *Caviarella aegopodii* on *Salix* spp., and carrot in, *Myzus persicae* infesting chrysanthemums in, 533; aphidivorous Cecidomyiids in, 569; grasshoppers, crickets and cockroaches of, 571; legislation and control of pesticides in, 572; *Ptinus tectus* in flour in, 601; organochlorine insecticides in atmospheric environment in, effects of BHC seed dressing on breeding pheasants in, 618; *Dasyneura affinis* infesting violets in, *Scolytus scolytus* on elm in, 650; *Cydia conicolana* on *Pinus sylvestris* in, 651; *Aphis triglochis* in, 653
- British Columbia, tests of viruses on Geometrids in, *Choristoneura fumiferana* on *Abies* and *Picea* in, pests of strawberry in, 18; *Malacosoma pluviale* in, *Trypodendron lineatum* on *Pseudotsuga menziesii* in, 22; *Cephalcia fascipennis* on spruce in, 152; *Ips swainei* on spruce in, 153; *Dendroctonus ponderosae* on *Pinus contorta latifolia* in, 155; *Synergus pacificus* in, 179; *Chimaphila salicella* on blueberries in, 267; *Sciophites obscurus* and *Otiorynchus sulcatus* on strawberry in, 268; fungus repositories in *Platypus wilsoni* in, 310; climatic areas in population studies of *Malacosoma pluviale* in, 346; control of *Hylemya brassicae* and *Hylemya floralis* on swede in, *Chrysophana placida* infesting log house in, 420; control of *Hylemya brassicae* on radish in, control of *Psila rosae* on carrots in, sprays against *Contarinia* spp. and *Oligonychus ununguis* on *Pseudotsuga menziesii* in, *Pelecomalium testaceum* damaging flowers of fruit trees and bushes in, 421; control of *Sitodiplosis mosellana* on wheat in, *Sciophites obscurus* and *Nemocestes incomptus* on strawberry in, *Trachyploeus bifoveolatus* on strawberry in, unusual records of *Lasioderma serricorne* in, 422; distribution and hosts of *Pissodes schwarzi* and *Pissodes curriei* in, *Haltica tombacina* defoliating fireweed in, activity rhythms of *Hemerocampa pseudotsugata* in, 423; parasites of *Pieris rapae* on cabbage in, 594
- British Guiana (see Guyana)
- British Honduras, mites of subfamily Phytoseiinae in, 211
- Broccoli, varietal resistance of, to insect attack in Wisconsin, 275; persistence of dimethoate on, aphids on, in U.S.A., 363
- Brome Grass (see *Bromus*)
- Bromocyclen, toxicity of, to *Coccinella septempunctata*, 85; as protectant for wheat against stored-product insects, 364; in dusts against pests of stored maize, 394; against *Lasioderma serricorne*, 583
- Bromodan (see Bromocyclen)
- 4-Bromo-2,5-dichlorophenyl Diethyl Phosphorothionate (see Bromophosethyl)
- 1-Bromo-4,5,6,7,8,8-hexachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene, against *Lasioderma serricorne*, 583
- Bromophos, survey of data on, 81; tests of, against *Brachycolus noxius*, 83; against *Tribolium* spp., 254; metabolism of, in stored wheat grain, 600

- Bromophos-ethyl, chemical definition of, **1**  
 Bromoxon (see Dimethyl 4-Bromo-2,5-dichlorophenyl Phosphate)  
*Bromus*, *Stenodiplosis bromicola* on, in Nebraska, **371**  
*Bromus anomalus*, damaged by *Stenodiplosis bromicola* in U.S.A., **639**  
*Bromus ciliatus*, damaged by *Stenodiplosis bromicola* in U.S.A., **639**  
*Bromus erectus*, *Stenodiplosis bromicola* on, in Soviet Union, **322**  
*Bromus inermis*, *Stenodiplosis bromicola* on, in Soviet Union, **322**; *Tarsonemus muehlei* sp.n., on, in Germany, **337**; *Thymelicus lineola* not found on, in Ontario, **350**; damaged by barley yellow-dwarf virus in Czechoslovakia, **631**; damaged by *Stenodiplosis bromicola* in U.S.A., **639**  
*Bromus kalmii*, damaged by *Stenodiplosis bromicola* in U.S.A., **639**  
*Bromus purgans*, damaged by *Stenodiplosis bromicola* in U.S.A., **639**  
*Brontispa longissima*, attempted establishment of *Tetrastichus brontispae* against, on palms in New Caledonia, **560**  
 Broodcomb, *Bacillus thuringiensis* in treatment of, **430**  
*Bruchidius unicolor*, bionomics and control of, on sainfoin in Bulgaria, **554**  
*Bruchus rufimanus*, water content of, in Japan, **548**  
*Brumus suturalis*, predacious on *Aphis sacchari* and *Aphis indosacchari* in India, **479**  
 Brussels Sprouts, pests of, in Britain, **230**; varietal resistance of, to insect attack in Wisconsin, **275**; varietal resistance of, to insect pests in Britain, **506**; varietal resistance of, to *Phyllotreta striolata* in North Carolina, **524**  
*Bryobia praetiosa*, acaricides against, on apple in Iran, **40**; *B. rubrioculus* misidentified as, in Chile, **47**; spray programmes for control of, on apple in Poland, **453**; susceptibility of apple varieties to, in Michigan; resistance to organophosphorous compounds in, **642**  
*Bryobia redikorzevi*, distribution of, on fruit trees in Soviet Union, **141**; associated with *Panonychus ulmi* on apple in Bulgaria, **325**  
*Bryobia rubiocolus*, on apple in Chile, **47**; paper chromatography to detect predation on, **206**; on plants in Poland, **633**; chemical control of, on apple in Uruguay, **640**  
*Bryonia dioica*, *Aphis gossypii* on, in France, **457**  
*Bubucius ibis*, as predator of *Nomadacris septemfasciata* in Tanganyika, **627**  
*Bucculatrix thurberiella*, tests of O-methyl O-p-methylthiophenyl methylphosphonothioate and related compounds against, on cotton, **357**  
*Bucentes cristata*, parasitic in Tipulid larvae in Italy, **329**  
*Bucentes geniculata*, parasitic in Tipulid larvae in Italy, **329**  
 Bugs, on maize in Soviet Union, **633**  
 Building Timber, termites attacking, in Italy, **329**; control of termites in, **334**; *Eupactus solidus* attacking, **389**; infested by *Lyctus linearis* in Hungary, **402**; attacked by *Reti-*  
*culitermes santoniensis* in France, **560**; infestation by *Hyilotrupes bajulus* in, in Germany, **658**  
 Bulan, mixture of Prolan and (see Dilan)  
 Bulgaria, *Leptinotarsa decemlineata* on potato in, **196**; bionomics of *Typhlocyba rosae* in; *Chlorops pumilionis* on wheat in; *Chaetocnema* spp. on beet in, **197**; *Salebria semirubella sanguinella* on lucerne in, **198**; stolbur virus disease and *Hyalesthes obsoletus* in, **198**; *Bryobia redikorzevi* and *Panonychus ulmi* on apple in, **325**; *Tettigella viridis* in; *Otiorrhynchus* spp., on strawberry in, **326**; aphids on *Prunus mahaleb* in; *Ischnonyx prunorum* on plum, damson and blackthorn in; *Lobesia botrana* on grapes in, **327**; aphids on vegetables and *Rhopalosiphum maidis* on leek in, **328**; *Bacillus thuringiensis* isolated from *Lymnatria dispar* in, **428**; *Eurygaster integriceps* and other pests of wheat in; *Eurytoma onobrychidis* and *Bruchidius unicolor* on sainfoin in, **554**; *Beauveria* spp., alone or with DDT, against *Leptinotarsa decemlineata* on potato in; *Phyllotreta cruciferae* attacking crucifers in, **555**; *Janus compressus* as pest of pear in; *Cladius pectinicornis* in; *Collicularia microgrammana* on lucerne in, **556**; new records of Coccids on ornamental plants in; Aphelinid parasites of *Hemiberlesia rapax* and *Pinnaspis aspidistrae* in, **557**; Aphidiine parasites of aphids in, **603**  
 Bulgariæleurodes cotesii, on rose in Soviet Union, **510**  
*Bupalus piniarius*, effect of insecticidal dusts against, on pine in Soviet Union, **189**; investigations on population dynamics of, on *Pinus sylvestris* in Holland, **297**  
 Burlap, as pupation medium for *Rhagoletis pomonella*, **162**  
 Burma, survey of pests of economic plants in, **571**; *Oryzaephilus surinamensis* in, **601**  
*Busseola fusca*, infestation rates by, on maize in Tanganyika, **577**  
 Butacarb, chemical definition of, **1**  
 2,3-Butanedione, *Drosophila melanogaster* responding to, **289**  
*Butea monosperma*, damaged by *Lachnosterna serrata* in India, **259**  
 $\beta$ -butoxy  $\beta'$ -thiocyanodiethyl ether, toxicity of, to *Tribolium castaneum* and *Sitophilus oryzae*, **217, 261**  
 n-Butyl Isothiocyanate (as fumigant) against pests of stored products, **488**  
 n-Butyl Methacrylate, modification of imbedding method using, **344**  
 2-(p-tert.-Butylphenoxy) cyclohexyl 2-Propynyl Sulphite, in sprays against *Panonychus ulmi*, **284**  
 2-(p-tert.-Butylphenoxy)-1-ethylethyl o-Tolyl Sulphite, in sprays against *Panonychus ulmi*, **284**  
 Butyric Acid, as repellent to *Eurytoma roddi*, **57**

## C

C-8514 (see N-(2-Methyl-4-chlorophenyl)-N', N'-dimethyl-formamidine)



- Cabbage, *Athalia rosae* reared on, 53; pests of, in Wisconsin, 66, 67; varietal susceptibility of, to pests, 66, 67; development of *Murgantia histrionica* on, 68; insecticide residues on, 137; aphids on, in Poland, 139; distribution of eggs of *Mamestra brassicae* on, in Japan, 148; tolerance of, to methyl bromide fumigation and hot water treatments, 180; effects of soil applications of DDT and aldrin on, 231; varietal resistance of, to insect attack in Wisconsin, 275; sterile male releases of *Trichoplusia ni* on, in California, 283; *Pieris brassicae* reared on, not accepting artificial diet, 292; *Pieris brassicae* on, in India, 318; *Hylemya brassicae* on, in Britain, 335; control of Lepidopterous larvae on, in Canada, 348; persistence of dimethoate on, aphids on, in U.S.A., 363; effects of systemic insecticides on, against *Trichoplusia ni* and *Brevicoryne brassicae* in Texas, 414; pests of, in Soviet Union, 432; in diets for laboratory-reared *Pieris brassicae*, 448; *Melolontha melolontha* reared on leaves and stems of, in France, 460; *Athalia rosae ruficornis* on, in China, 483; *Eurydema ornatum chloroticum* on, in China, 483; *Hylemya* spp. on, in Soviet Union, 511; varietal resistance of, to *Phyllotreta striolata* in North Carolina, 524; *Mamestra brassicae* on, in Japan, 548; chemical treatment of, against *Hylemya* spp., in Soviet Union, 552; *Pieris brassicae* on, in Soviet Union, 553; *Phyllotreta cruciferae* on, in Bulgaria, 555; survival of *Perillioides bioculatus* feeding on, 575; parasites of *Pieris rapae* on, in British Columbia, 594
- Cabbage, Chinese (see *Brassica pekinensis*)
- Cabbage Worm (see *Pieris*)
- Cabinets, for rearing insects, 72
- Cacao, *Distantiella theobroma* on, in Ghana, 72; physiological state of, in relation to infestation by *Selenothrips rubrocinctus*, 74; pests of, in Ivory Coast, 109; *Termatophylidea opaca* preying on *Selenothrips rubrocinctus* on, in Dutch Guiana, 171; damaged by *Azteca paraensis bondari* in Brazil, 287; *Distantiella theobroma* and *Sahlbergella singularis* on, in Ghana, 333; Scolytids and Platypodids on, in Costa Rica, 375; *Acanthopsyche tristoides* sp.n., on, in Ghana and Nigeria, 403; bromide residues from methyl bromide fumigation of, 419; *Deretrichia szentivani* sp.n., on, in New Britain and Feni Islands, 463; *Acrocercops cramerella* on, in Philippines, 481; movement of  $^{32}\text{P}$ -labelled dimethoate in, in Ghana, 532; *Colobothea distincta* on, in Costa Rica, 538; bibliography of virus diseases and mealybug vectors of, 572; world bibliography of Mirids and Heteroptera on, 572; Lepidoptera associated with, in West Africa, 620; *Ferrisia virgata* and *Planococcoides njalensis* as vectors of swollen-shoot virus in, in Nigeria, 625; *Sahlbergella singularis* and *Distantiella theobroma* on, in Nigeria; *Helopeltis* spp. not found on, in Nigeria; Mirids reared on, 626; factors affecting number of *Earias biplaga* on, in Nigeria, 626; *Anomis leona* and *Bathycoelia ovalis* on, in Nigeria, 627
- Cacao Beans (Stored), no breeding of *Sitophilus granarius* in, 5
- Cacoecimorpha pronubana*, differences between *Epichorista ionephela* and, 345
- Cadra cautella*, effects of calcium orthophosphate on, in wheat flour, 50; infesting stored groundnuts in Nigeria, 110; infesting stored dates in Israel, 143; effect of  $\gamma$ -radiation on, 252; dust treatments against, in stored maize in Kenya, 394; fumigation against, in bagged wheat in India, 399; susceptibility of, to *Bacillus thuringiensis*, 430; method for control of, in stored grain in India, 477; bionomics and control of, associated with *Planococcus citri* on *Citrus* in Sicily, 609
- Caffeic Acid, with sucrose, stimulating feeding by *Choristoneura fumiferana* on *Picea glauca*, 158
- Cage, for rearing Trypetids, 45; for feeding tests of Coccinellid predators of aphids, 180; for rearing *Conotrachelus nenuphar*, 286; for rearing grasshoppers, 296; for small arthropods, 619
- Cajanus cajan*, new virus disease of, in India, 217; *Thosoa aperiens* on, in India, 663
- Calacarus carinatus*, tests of sprays against, on tea in India; mist-blower for applying insecticides against, on tea in India, 398; on camellia in Florida, 543; infesting tea in India, 663
- Calcium Arsenate, unsatisfactory against *Spodoptera littoralis*, 84
- Calcium Chloride, effects of, on deposits of DDT, 366
- Calcium Cyanide, in traps for *Pectinophora gossypiella*, 589
- Calcium Nitrate, effect of, on reproduction of *Tetranychus telarius*, 353
- Calcium Orthophosphate, effects of, on insects, 50
- Calcium Polysulphide, in sprays against Coccids, 328
- Calepitrimerus*, sprays against, on vines in Soviet Union, 509
- Calidea*, control of species of, on cotton in Kenya, 134
- Calidea dregii*, bionomics of, on *Jatropha podagrica* in Ghana, 645
- California, *Lygus hesperus* on cotton in, 37; *Lygus hesperus* on lucerne in; *Nabis ferus* in, 37; pests of pear in, 38; natural enemies of pests in, 39; pests of pine in, 41, 42; *Psylla pyricola* on pear in, 55; *Coccus pseudomagnoliarum* on *Citrus* in, 60; *Aleurocybotus occidius* on grasses in, 62; *Ibalia ensiger* parasitising Siricids in, *Eurytoma tumoris* on *Pinus sylvestris* in, *Aphrophora* spp. on pine in, 68; *Melanophila consputa* on pine in, 69; virus disease of beet, spinach, cucumber, flax, lettuce, carrot and other plants in, 71; *Liriomyza langei* misidentified as *L. bryoniae* in, 112; *Arhopalus asperatus* on pine in, 116; *Oinophila v-flava* introduced into, from Europe, 116; new records of Hymenopterous parasites from Scolytids in, 155; *Euleia fratria* on *Heracleum lanatum* in, 159; *Lissorhoptrus oryzophilus* on rice in, 161; *Toumeyella pinicola* on *Pinus radiata* in, 164; virus disease of *Panonychus citri* on orange in, 167; *Scolytus ventralis* on *Abies concolor*

- in, 170; *Psylla uncatoides* on *Acacia* and *Albizia* in, 180; *Tomicobia tibialis* parasitising *Ips confusus* on pine in; *Paramyelois transitella* on almonds in, 206; mite control in, 269; *Salvia aethiops* in, 273; sterile male releases of *Trichoplusia ni* on cabbage in, 283; *Panonychus ulmi* on apple in, 284; *Pityophthorus confertus* on pine in, 303; *Amblyseius hibisci* predacious on *Oligonychus punicae* in, 306; *Encarsia formosa* parasitic in *Trialeurodes vaporariorum* in, 306; *Rhyacionia zozana* on pine in, 307; distribution of eggs of species of *Neodiprion* on *Pinus ponderosa* in, 311; *Choristoneura lambertiana subretiniana* on pine in, 347; *Tetranychus telarius* on strawberry in, 365; *Aleyrodes spiraeoides* on cotton in, 369; control of *Stomacoccus platani* on sycamores in, 486; maize resistance to *Heliothis zea* in, 488; orange water spot protection by gibberellic acid in, 491; ultraviolet-light traps baited with female sex pheromone for *Trichoplusia ni* in, 492; *Plagiostrochus suberi* and other pests of cork oak in, 494; laboratory rearing of larvae of *Hemerocampa pseudotsugata* in, 496; effect of environment on mating in *Trichoplusia ni* in, 538; *Phanerotoma* spp., parasitising *Paramyelois transitella* (on almond) in; establishment of *Chilocorus bipustulatus* in olive groves in, 543; biological control of spider mites in, 579; *Heliothis zea* on maize in, 582; natural enemies of *Lygus* spp. on lucerne in, 583; control of *Thrips tabaci* on onion in, 590; *Melanophila californica* in pine bark in, 596; *Sitophilus oryzae* on sorghum in, 602; reproduction in uniparental race of *Trichogramma semifumatum* in, 648
- Calliphora*, predacious on *Aphis sacchari* and *Aphis indosacchari* in India, 479
- Callispa minima*, species of *Callispa* near, feeding on coconut in India, 261
- Callistephus chinensis*, infected by virus disease of artichokes, 107; virus of, affecting survival of *Dalbulus maidis*, labelled with  $^{14}\text{C}$  and  $^{32}\text{P}$ , 345
- Callitula bicolor*, attacking *Oscinella frit* in Britain, 467
- Callosobruchus*, infesting processed food bari in storage in India, 399
- Callosobruchus analis*, water content of, in Japan, 548
- Callosobruchus chinensis*, joint similar action of apholate and metepa in sterilization of, 148; growth of, on beans of grafted *Phaseolus* plants, 150; mating competitiveness of apholate-treated males of, 151; bionomics of, on cowpeas in India, 215; adaptive changes induced by insecticidal selection of, 235; water content of, in Japan, 548
- Callosobruchus maculatus*, bionomics and control of, in China, 264; water content of, in Japan, 548
- Callosobruchus phaseoli*, water content of, in Japan, 548
- Callosobruchus rhodesianus*, water content of, in Japan, 548
- Caloglyphus*, association between *Phyllophaga anxia* and, in Nebraska, 343
- Calophyllum inophyllum*,  $\gamma$ -radiation as quarantine treatment of, 284
- Caloptilia azaleella*, distribution map of, 401
- Caloptilia syringella*, distribution map of, 401; control measures against, infesting lilac in Alberta, 649
- Calosoma alternans*, preying on *Mocis repanda* in Venezuela, 212
- Calosoma inquisitor*, preying on *Archips crataeganus* on oak in Czechoslovakia, 199
- Calosoma sycophanta*, bionomics and rearing of, 256
- Calvolia chilensis*, bionomics of, on apple in Chile, 47
- Calyptra excavata*, orchard illumination against, in Japan, 148
- Calyptra gruesa*, orchard illumination against, in Japan, 148
- Cambodia, review of diseases and pests of economic plants in, 462
- Camellia*, Eriophyids on, in Florida, 543
- Cameroon, *Anonaepestis tamsi* on *Piper nigrum* in, 73
- Camnula pellucida*, outbreaks of, in relation to native grasslands and cereal crops in Saskatchewan, 310
- Campoletis*, parasitising *Heliothis* spp., in U.S.A., 539
- Camponotus*, *Cinara* attacking *Pseudotsuga menziesii* associated with, in Washington, 152
- Camponotus herculeanus*, infesting forest trees in Germany, 456
- Camponotus herculeanus pennsylvanicus*, predacious on *Enarmonia* larvae in Quebec, 349
- Camponotus ligniperdus*, infesting forest trees in Germany, 456
- Campoplex ramidulus*, effectiveness of, as parasite of *Rhyacionia buoliana* increased by nectar-bearing plants, 90
- Campylomma verbasci*, as predator of aphids and mites on apple and pear in U.S.A. and Canada, 46
- Canada, forest pests in, 20; *Lithocolletis* on apple in, 21; *Campylomma verbasci* on mullein in, 46; *Cephalcia fascipennis* on spruce in, 152; *Ips* spp. in, 153; suitability of climatic areas of, for infestation of stored grain insects, 156; armed forces manual on pest control in, 158; cattle fed forages treated with insecticides in, 187; *Centistes lituratus* parasitising *Sitona scissifrons* in, 202; *Ips* spp. in, 205; *Tomicobia tibialis* parasitising *Ips* spp. in, 206; *Hoplocampa brevis* on pear in, 239; occurrence of insects and other arthropods in, 239; air contamination in, 248; *Hypoaspis aculeifer* in, 308; machine method for mapping insect survey records in, 309; parasites of Scolytids in, 309; Group VI of *Ips* species in, 310; wheat damaged by *Chlorochroa sayi* in, 312; list of natural enemies of arthropod pests in; insect pests of raspberry and other cane fruits in, 343; Coccinellid larvae reared on dry foods in; Lepidopterous larvae on cabbage in, 348; mass rearing of root maggots under controlled environmental conditions in, 363; larvae of *Epinotia criddleana* in, *Pseudexentera oregonana* on trembling aspen in, 402; viral control of forest pests in, 432; insects associated with stored products in,



- 502; control of *Macrosiphum pisum* on pea in, 534; control of fabric pests in, 571; suitability of *Ceutorhynchus litura* for introduction against *Cirsium arvense* in, 616; larch pests and their parasites in, 660
- Canary Islands, race of *Pieris brassicae* in, 48
- Cancer (see Carcinogenicity)
- Cane Fruits, insect pests of, in Canada, 343
- Capitophorus fragaefolii*, transmitting viruses to strawberry in Spain, 388; apparent increases in, caused by phorate and disulfoton, on strawberries in Washington State, 588
- Capitophorus ribis*, found in abandoned feeding-sites of Tortricids in Poland, 603
- Capnodis tenebrionis*, insecticides against, on fruit trees in Malta, 135
- Capsella bursapastoris*, *Aphis gossypii* on, in France, 457
- Capsicum*, *Liriomyza munda* on, and factors affecting growth of, in Florida, 208; *Euzophera osseata* on, in Israel, Egypt, and other Mediterranean countries, 611
- Capsicum annuum*, stolbur virus disease of, in Bulgaria, 198
- Captan, seed treatments with mixtures of insecticides and, 43; and other fungicides, 122; in sprays against *Venturia inaequalis* not harming beneficial mites and insects, 122; effect of, in sprays on arthropod fauna of apple, 167; and *Bacillus thuringiensis*, 167; and DDT, in sprays against apple pests, 279; use of, in mass rearing *Conotrachelus nenuphar*, 286; in sprays against apple pests, not harmful to Phytoseiids, 360; on seeds reducing phytotoxic effect of diazinon, 421; in sprays against *Panonychus ulmi*, susceptibility of *Blepharidopterus angulatus* to spray programmes of, effect of, on *Typhlodromus pyri*, 470; and dicofol, avoidance of russetting of apples by, 472; harmful interaction between with 2,2'-methylenebis(3,4,6-trichlorophenol) and systemic insecticides, no adverse effects with, and pentachloronitrobenzene applied with systemic insecticides, 641
- Carabids, as predators of *Hylemya brassicae* in Britain, 335
- Caragana arborescens*, *Bupalus piniarius* on, in Soviet Union, 190
- Carassius auratus*, toxicity of insecticide to, 161
- Caraway (see *Carum carvi*)
- Carbamates, chemical analysis of, 404
- Carbanolate (see Chloroxylam)
- Carbaryl, against *Cydia pomonella*, 10; against *Bryobia praetiosa*, 10; effects of, on bees, 40; against *Lambdina fiscellaria lugubrosa*, 42; against *Heliothis zea*, 45; effects of humidity on persistence of, 47; unsatisfactory against *Chilo suppressalis*, 48; against *Leptinotarsa decemlineata*, 52; against *Mycodiplosis alternata*, 69; toxicity of, to *Distantiella theobroma*, 72; toxicity of, to *Cydia pomonella*, 75; persistence of, on apple, 76; toxicity of, to *Spodoptera littoralis*, 84; against aphids, toxicity of, to *Coccinella septempunctata*, 85; in sprays against apple pests not affecting population of *Typhlodromus pyri*, 122; against *Eriosoma lanigerum* harmful to *Aphelinus mali*, 123; and DDT, 127; in dusts and sprays against *Rhyacionia buoliana*, 127; oil reducing toxicity of, to *Pauridia peregrina*, 132; in sprays against *Zeuzera pyrina* and *Cydia pomonella*, 135; in sprays against *Toumeyella pinicola*; destroying natural enemies of *Tetranychus cinnabarinus*, 164; against *Diatraea saccharalis*, 166; increasing populations of *Myzus persicae*, 167; in sprays against *Psylla uncatoides*, 180; significant developments with, specificity of, 185; determination of residues of, on crops, 186; in sprays against *Paramyeloides transitella*, 206; in sprays against Coccids, 208; in sprays and dusts against cotton boll-worms, 211; in sprays and dusts against *Mocis repanda*, 212; in sprays against *Spodoptera littoralis*, 213; not effective against *Armonia formosana*, 230; soil treatment with, in dusts against *Cyrtomenus mirabilis*, 242; in spray against *Alabama argillacea*; in dusts against *Oxycaenus hyalinipennis*, 243; effect of contamination of hives with, on bee mortality, 247; toxicity of, to *Amsacta moorei*, 259; in granules and in spray against *Atherigona indica*, 262; in sprays against *Cheimophila salicella*; residues on maize from, in sprays against *Ostrinia nubilalis*, 267; in sprays against *Paratirioza cockerelli* and *Myzus persicae*, 268; in sprays against *Pediasia* spp.; contact versus stomach toxicity of, to *Spodoptera littoralis*, 269; in sprays applied to irrigated rice not affecting *Procambarus clarkii*, 282; swollen abdomens in *Cydia molesta* treated with, 296; in dusts, against *Rhagoletis pomonella*, 301; in sprays, against *Lema melanopa*, 302; against *Musgraveia sulciventris*, 314; toxicity of, to adults of *Dacus curcurbitae*, 316; toxicity of, to *Aonidiella aurantii*, 317; effect of, on insect fauna on apple; against *Archippus oporanthus* and *Cydia pomonella*, 330; dosage distribution of, applied from aircraft, on cotton, 334; against *Pseudaletia unipuncta*, 350; and dicofol, effects of, on pests of peach, 352; against *Spodoptera littoralis*, 357; in sprays against *Argyrotaenia velutinana*, persistence of, on grape foliage, 358; in sprays against apple pests, 360; alone and with spore preparations of *Bacillus thuringiensis*, against *Heliothis zea*, *Trichoplusia ni* and *Macrosiphum ambrosiae*, 367; effect of sprays of, against *Frankliniella fusca* on yield of groundnuts, 376; metabolism of, in rat, guinea pig and man, 404; in dusts and sprays against *Trialeurodes floricidensis*, 416; in dusts against *Galerucella birmanica*, 440; effect of, against cotton pests, on crop yields, 442; with dicofol, effect of, on apple, against *Cydia pomonella*, 448; in sprays against *Petrobia latens*, 449; toxicity of, in sprays, to predacious insects, 471; toxicity of, to *Spodoptera littoralis*; effects of, on maize yields, in sprays and granules against maize borers, 472; alone or with other pesticides in sprays against cotton worms, effect of, on populations of spider mites, 474; effect of, on *Tetranychus telarius*, 484; in sprays and granules, effect of temperature on, against *Cotinis nitida*, 485; alone and in oil emulsions, in sprays against *Stomacoccus platani*, 486; in sprays against *Heliothis zea*, 486; toxicity of,

- to *Hylemya brassicae*, 493; in sprays against *Plagiostrochus suberi*, 494; in sprays against *Anthonomus grandis*, 499; in sprays against *Rhagoletis cerasi*, 514; in sprays against *Aegeria tipuliformis*, 520; labelled with  $^{14}\text{C}$  fate of, in rats, 524; comparative susceptibility of males and females of *Nephotettix cincticeps* to, 546; against *Cnephasia longana*, 568; against *Blaniulus guttulatus*, 577; harmful to beneficial mites, 579; in dusts and sprays, against *Chlamisus cribripennis*, 581; against *Lasioderma serricorne*, 583; alone and with oil emulsions and polyethylene spreader, in sprays against *Thrips tabaci*, 590; in sprays against *Gymnoscelis pumilata*, 608; tests of, against *Phthorimaea operculella*, 613; in sprays against *Chilo suppressalis*, *Tryporyza incertulas* and *Sesamia inferens*, 615; persistence of deposits of, used in sprays against stored-product beetles, 622; in dusts against *Dysdercus* spp., 624; in sprays against *Sahlbergia singularis* and other Mirids, 626; effects of, in sprays on insect fauna of olive and *Citrus*, 628; ineffective in sprays against *Hypocala andremona*, 639; in sprays against *Lema melanopa*, 641; against *Psylla pyricola*, 643; seed treatment with, against *Podagrica* spp., in sprays against *Diparopsis watersi*, 656
- Carbolineum (see Tar Distillate)
- Carbon, mechanical transmission of virus disease of artichokes by, 106
- Carbon, Radioactive, insecticides labelled with, 19, 28; Zectran labelled with, 186; DDD labelled with, 187; DDT labelled with, 374; insecticides labelled with, 485; insecticides labelled with, 488; insecticides labelled with, 491; measuring food consumption of *Agrotis orthogonia* with, 620; transfer of, from *Psylla pyricola* to pear seedlings, 621; uric acid labelled with, 645
- Carbon Bisulphide, toxicity of, to *Aonidiella aurantii*, 85; (as fumigant), in mixtures with other fumigants, against pests of stored products, 542; (as fumigant), against *Tribolium confusum* during induced elevation or depression of respiration, 584
- Carbon Dioxide, effects of increased tensions of, on Coleoptera in stored grain, 4; effects on orthoptera of anaesthetisation with, 65; effect of, on respiration in *Tribolium*, 584
- Carbon Tetrachloride, sorption of, by cereal products, 186; in mixture with other fumigants, residues of, in milled wheat products, 373; effects of, as fumigant for cardamom, 398; and ethylene dichloride, as fumigant for bagged wheat under tarpaulins, 399; (as fumigant), in mixtures with other fumigants against pests of stored products, 542; (as fumigant), against *Tribolium confusum* during induced elevation or depression of respiration, 584; in light traps against *Cydia pomonella*, 661
- Carbophenothion, toxicity of, to *Cydia pomonella*, 75; tests of, against *Brachycolus noxius*, 83; toxicity of, to *Coccinella septempunctata*, 85; in tests against *Cydia pomonella*, 93; toxicity of, to cyclodiene-susceptible and cyclodiene-resistant strains of *Hylemya antiqua*; toxicity of, to *Tetranychus cinnabarinus*, 163; in sprays against *Tetranychus telarius*, 164; in sprays against *Tetranychus telarius*, 232; toxicity of, to *Aonidiella aurantii*, 317; toxicity of, to *Oligonychus indicus*, and persistence of, on plants, 318; alone or with disulfoton against *Spodoptera littoralis*, 357; not toxic to oranges, in sprays against *Aonidiella aurantii*, 393; in sprays against *Cydia leucostoma*, 397; in sprays against *Oligonychus coffeae* and *Calacarus carinatus*, 398; in control of *Cydia pomonella*, 448; ineffective against *Scaphoideus littoralis*, 458; in sprays against *Heliothis zea*, 486; in sprays against *Phytomyza atricornis*, 584; in sprays against *Bryobia rubrioculus*, 640; in sprays against *Neodiprion taedae linearis*, 643; persistence of, against *Tetranychus telarius*, 662
- Carbothion (see Malathion)
- Carcelia, *Epantheria icasia* parasitised by, in Costa Rica, 645
- Carcelia bombylans, parasitic on *Dendrolimus spectabilis* in Japan, 115
- Carcinogenicity, evaluation of agricultural chemicals for, 248
- Cardamom (see *Anomum subulatum*)
- Cardiochiles nigriceps, factors affecting selection of *Heliothis* spp. by, 30; parasitising *Heliothis* spp. in U.S.A., 539; parasitising *Heliothis virescens* on tobacco in Mississippi, 581
- Caripeta divisata, viruses diseases of, 18
- Carissa carandas, damaged by *Digama hearsyana* in India, 638
- Carnation, *Epichorista ionephela* on, 345
- Carneocephala flaviceps, in Florida, 543
- Carneocephala floridana, in Florida, 543
- Carneocephala sagittifera, in Florida, 543
- Carolina, *Thyridopteryx ephemeraeformis* on *Pinus strobus* in, 29; *Diphanis nitidalis* on squash in, 31; *Heliothis zea* on cotton in, 45
- Carolina Cranesbill (see *Geranium carolinianum*)
- Carolina, North, *Euzophera magnolialis* s.p.n. attacking magnolia in, 210; *Anthonomus grandis* on cotton in, 271; cotton insects in, 272; *Conoderus* spp. in sweet potatoes in, 274; diapause in *Protoparce sexta* in, 306; control of *Ephestia elutella* in stored tobacco in, 355; *Aphidecta oblitterata* predacious on *Adelges piceae* on Fraser fir in; infestations of *Adelges piceae* on Fraser fir in; insecticides against *Cotinis nitida* in, 485; *Macrosiphum pisum* parasitised by *Aphidius smithi* in, 501; resistance of commercial crucifer varieties to *Phyllotreta striolata* in, 524; *Conotrachelus nenuphar* in, 540; *Thanasimus dubius* preying on *Dendroctonus frontalis* on pine in, 542; *Manduca sexta* on tobacco in, 580; varietal resistance of beans to *Epilachna varivestis* in, 586; *Sathrobrota rileyi* and other pests of maize in, 588; *Cydia toreuta* attacking *Pinus echinata* in, 596
- Carolina, South, control of *Ephestia elutella* in stored tobacco in, 355; hibernation of *Anthonomus grandis* in, 355; food-plant selection by *Anthonomus grandis* in, 362; fatty acid composition of *Hypera variabilis* in, 413; *Heliothis* spp., on *Geranium carolinianum* and *Linaria canadensis* in, 539; unusual form of



- Phytomyza ilicicola* on *Ilex opaca* in, 540; *Sathrobrotia rileyi* and other pests of maize in, 588; *Cydia toreuta* attacking *Pinus echinata* in; winter mortality of *Anthonomus grandis* on cotton in, 596
- β-Carotene, attractiveness of, to *Eurytoma roddi*, 57
- Carp (see *Cyprinus carpio*)
- Carpinus*, *Lymantria dispar* on, in Yugoslavia, 7
- Carpocoris*, *Asolcus* spp. parasitising eggs of, in Soviet Union, 189
- Carpocoris fuscispinus*, *Asolcus* spp. parasitising eggs of, in Soviet Union, 189; as alternative host for egg parasites of *Eurygaster integriceps* in Soviet Union, 549
- Carpoglyphus*, on apple in Chile, feeding habits of, 48
- Carpoglyphus lactis*, effects of temperature, humidity and low pressure on, in dried figs in Portugal, 387; factors affecting breeding rate of, 546
- Carpophilus dimidiatus*, infesting stored groundnuts in Nigeria, 110; infesting stored dates in Israel, 143
- Carpophilus hemipterus*, infesting stored dates in Israel, 143
- Carposan 50 (see Parathion)
- Carrot, virus disease of, in California, 71; *Psila rosae* on, in Britain, 80; in diet for *Melolontha melolontha*, 107; *Gryllotalpa gryllotalpa* reared on, 124; *Trioza apicalis* on, 136; insecticide residues in, following seed treatment against *Psila rosae*, 137; effects of soil applications of DDT and aldrin on, 231; translocation of insecticides into, 248; *Psila rosae* on, in British Columbia, and toxicity of insecticides to, 421; migration of *Cavariella aegopodii* from *Salix* spp. to, in Britain, 533; survival of *Perillioides bioculatus* feeding on, 575
- Carrot Powder, in diet for *Diatraea saccharalis*, 268
- Carthamus tinctorius*, damage to, by *Lygus hesperus* and *Frankliniella occidentalis* in California, 276; bees associated with, in Arizona, 524; insect pests of, in Israel, 636
- Carum carvi*, oil of, as attractant for insect pests, 399; damaged by *Aceria carvi* in Czechoslovakia, 631
- Carya*, factors affecting attraction of *Scolytus quadrispinosus* to, in Wisconsin, 65
- Casama innotata*, bionomics and parasites of, on *Acacia karroo* in Libya, 51
- Casein, in diets for insects, 34; lime added to, against *Enarmonia formosana*, 195; in diet for *Anthrenus flavipes*, 441; in diet for *Tribolium* spp., 503
- Casein Hydrolysate, in diet for *Diatraea saccharalis*, 268; in diet for *Anthonomus grandis*, 280
- Cashew (see *Anacardium occidentale*)
- Cassia tora*, *Aphis craccivora* from, migrating to groundnuts in Uganda, 133
- Cassida nebulosa*, feeding inhibitors and food preference in, 290
- Castor (see *Ricinus communis*)
- Catabena esula*, release of, against *Lantana camara* in South Africa, 129
- Catolaccus aeneoviridis*, bionomics of, parasitising *Bathypsectes curculionis* in Delaware and New Jersey, 369
- Cattle, vitamin A concentrations in, fed forages treated with DDT and MCPA in Canada, 187; DDT residues in milk of, in New Zealand, 312; insecticide residues in *Citrus* pulp feed for, 374; insecticide residues in milk and tissues of, 418; method for determining insecticide residues in milk and tissues of, 419; secretion of DDT in milk of, 464; examination of milk of, for DDT residues, 654
- Cauliflower, *Hylemya brassicae* on, in Britain, 80; *Spodoptera litura* on, in India, 86; cultural practices in relation to virus disease of, 106; transmission of virus disease of, by aphids, and *Plutella maculipennis* on, in Britain, 231; varietal resistance to insect attack in, in Wisconsin, 275; *Pieris brassicae* on, in India, 318; *Hylemya brassicae* on, in Britain, 335; *Hylemya brassicae* on, in Belgium, 575
- Caulopsis cuspidata*, infestation and control of, on rice in British Guiana, 172
- Caulopsis gracillima*, infestation and control of, on rice in British Guiana, 172
- Cavariella aegopodii*, overwintering of, in egg stage on *Salix* spp., and control of, on carrot in Britain, 533
- Cecidomyiids, attacking *Hakea gibbosa* in New South Wales, 314
- Cecidophyes galli*, not infected by *Paecilomyces eriophytis*, 49
- Cecidophyopsis ribis*, causing leaf deformation of black currant in Germany, 54; effects of, on leaves and buds of black currant in Britain, 385; in relation to reversion virus and yield of black currants in Britain, 385; chemical control of, transmitting black currant reversion virus, on black currant in Britain, 470; on plants in Poland, 633
- Cedar, Incense (see *Libocedrus decurrens*)
- Cedrus*, *Ips tridentatus* on, in Turkey, 380
- Cela CA 6227 (see Trichlorphon)
- Celeriac, tolerance of, to methyl bromide fumigation and hot water treatments, 180
- Celerio euphorbiae*, effect of nutrient levels on food intake of, 23
- Celerio lineata livornica*, on olive trees in Tunisia, 393
- Celery, dimethyl 1-dimethylcarbamoyl-1-propen-2-yl phosphate residues in, 240; varietal susceptibility of, to *Psila rosae*, and insecticide treatment of *Euleia heraclei* on, in Britain, 469
- Cellulose, in diets for insects, 34; effect of, on development of *Anobium punctatum*, 181; in diet for *Ips calligraphus*, 209; factor hydrolyzing, in aphid saliva, 239; effect of termites on, in sapwood, 406
- Celtis*, *Pachypsylla* on, in U.S.A., 115
- Cement, persistence of insecticide deposits on, 622
- Cenopalpus pulcher*, distribution of, in Soviet Union, 142
- Centistes lituratus*, bionomics of, 202; parasitising *Sitona* spp. in Ukraine and Canada, 202

- Central African Republic, *Anonaepestis tamsi* on *Piper nigrum* in, 73
- Centurus carolinus*, as predator of *Zeadiatraea grandiosella* and *Ostrinia nubilalis*, 302
- Cephalcia fascipennis*, bionomics and parasitism of, on spruce in Canada, 152
- Cephus cinctus*, early cutting of wheat as measure against, in Alberta, 534; reaction to, in spring wheat in Alberta, 535
- Cerambyx dux*, insecticides against, on fruit trees in Malta, 135
- Cerambyx miles*, insecticides against, on fruit trees in Malta, 135
- Ceraphron tenuicornis*, parasitising *Dasyneura brassicae* on rape in Sweden, 182
- Cerataphis variabilis*, on palms in Florida, 543
- Ceratitis capitata*, experiments on sterilisation of adults of, 51; studies of population density of, in France, 52; attracted by honeydew, 99; as laboratory host for *Eupelmus urozonus*, 108; synthetic lures combined with toxicant against, on guava in South Africa, 129; insecticides against, on fruit trees in Malta, 135; differential effects of  $\gamma$ -radiation on, and parasites, 170; penetration and metabolism of endothion in, 228; ecology of, in Brazil, 241; control of, on peach in Brazil, 243; parasitised by *Opius concolor*, bitter orange as source of, factors limiting infestation of *Citrus* by, in Tunisia, secondary food-plants of, 244; toxicity of analogues of dichlorvos, trichlorophen and naled to, 283;  $\gamma$ -radiation as quarantine treatment against, infesting fruits in Hawaii, 284; anticholinesterase activity of analogues of dichlorvos, trichlorophen and naled with respect to heads of, 292; comparison of four types of yeast in diet of, in Costa Rica, 375; effect of one or more pairings on viability of eggs of, in Costa Rica, 375; yucca flour in diet of, in Costa Rica; tests of attractant for, in orchards in Argentina, 376; laboratory diet of, in Argentina, 409; *Opius* reared on, 607; insecticides against, on fruit trees in Israel, 613; attraction of starved males and females of, to trimedlure, 636; control of, in Mexico and Texas, 643; *Ceratitis rosa* distinguished from, 649
- Ceratitis rosa*, synthetic lures combined with toxicant against, on guava in South Africa, 129; as potential fruit pest in Florida, distinguished from *Ceratitis capitata*, 649
- Ceratocystis fagacearum*, *Pseudopityophthorus pruinosus* in relation to infection of oak by, 33
- Ceratocystis ulmi*, transmitted by *Scolytus sulcifrons* on elm in Soviet Union, 142; perithecial state of, in galleries of *Hylastes rufipes* on elm in Ontario, 179; *Xyloterinus politus* associated with, 502
- Ceratomegilla maculata*, preying on *Ostrinia nubilalis* on maize in U.S.A., 275; predacious on eggs of *Heliothis zea* in Arkansas, 416; DDT metabolism and excretion in, 488
- Ceratomegilla maculata lengi*, growth and development of larvae of, on dry foods in Canada, 348; preying on *Macrosiphum pisum*, 646
- Ceratostomella* (see *Ceratocystis*)
- Cereals, *Locusta migratoria migratoria* on, in Soviet Union, 10; pests of, in Soviet Union, 17; aphids on, in Georgia, 46; *Melolontha melolontha* on, in China, 89; Thysanoptera on, in Britain, 79; *Brachycolus noxius* on, in Turkey, 83; Anthomyiids on, in Soviet Union, 141; sorption of fumigant gases by, 186; damage to, by *Tanymecus indicus* in India, 214; *Aelia* and *Eurygaster* spp. on, in Middle East, 233; *Camnula pellucida* on, in Saskatchewan, 310; protection of, from pests in Soviet Union, 319; thrips on, in Holland, 341; *Pseudaletia unipuncta* on, in Ontario, 350; relative attractiveness of, to *Haplodiplosis equestris* in Germany, 380; *Apamea basilinea* on, in Mongolia, 438; *Zabrus tenebroides* on, in Rumania, 461; *Haplodiplosis equestris* on, in Germany, 565; damage to, by barley yellow-dwarf virus in Czechoslovakia, 631
- Cereals (Stored), effects of gaseous tensions on Coleoptera in, 4; *Sitophilus granarius* breeding in, 5; factors governing storage of in Nigeria, 50; detection of insects in, 117; pests of, overwintering in trees near granaries in Portugal, 387; insects and mites in, 465; factors affecting development of *Acarus siro* in, 466; method for control of *Cadra cautella* in, in India, 477; pests of, in Portugal, 487; effects of temperature on development of insect pests of, 523; treatment of, damaged by insects and mites in Turkey, 614
- Cereclor (see Wax, Chlorinated)
- Cermatulus nasalis*, predacious on caterpillars in New Zealand, 115
- Cerococcus*, species of, in Florida, 543
- Cerococcus catenarius*, bionomics and control of, on coffee in Brazil, 403
- Cerogenes auricoma*, *Hypopta agavis* parasitised by, 409
- Ceroplastes*, *Anicetus* spp.n. attacking, in India, 295
- Ceroplastes ceriferus*, in Florida, 543
- Ceroplastes cirripediformis*, in Florida, 543
- Ceroplastes floridensis*, mineral oils alone or with malathion against, on *Citrus* in Egypt, 473; in Florida, 543
- Ceroplastes pseudoceriferus*, parasitised by *Microterys amamensis* in Japan, 115
- Ceroplastes rubens*, in Florida, 543
- Ceroplastes rusci*, bionomics of, on fig in Lebanon, 98
- Ceroplastes sinensis*, infesting pear in Italy, 246
- Ceropsylla sideroxyli*, on *Sideroxylon foetidissimum* in Florida, 543
- Cetonia aurata*, rearing of *Microphthalma europaea* on, 105
- Cetyl Trimethyl Ammonium Bromide, effects of, on deposits of DDT, 366
- Ceutorhynchus assimilis*, natural enemies of, on rape in Sweden, 182; voltinism and its determination in, on crucifers, 239
- Ceutorhynchus litura*, suitability of, for introduction against *Cirsium arvense* in Canada, 616
- Ceutorhynchus napi*, effect of control measures on parasites of, on rape in Germany, 618



- Ceutorhynchus pleurostigma*, voltinism and its determination in, on crucifers, 239; disappearance of, from treated rape crops in Germany, 339
- Ceutorhynchus quadridens*, parasitised by *Aneulicis exilis* on rape in Sweden, 182; effect of control measures on parasites of, on rape in Germany, 618
- Ceylon, natural enemies and diseases of
- Nephantis serinopa* on coconut in, 56;
- Nephotettix apicalis* in, 87; pests of tea in, 185; flight and dispersal of *Xyleborus fornicatus* in, 235; *Polytela gloriosae* infesting lilies in, 258; *Xyleborus fornicatus* on tea in, 441, 446
- Chad, *Schistocerca gregaria* in, 597
- Chaetanaphothrips clarus*, *Chaetanaphothrips orchidii* distinct from, 403
- Chaetanaphothrips orchidii*, *Chaetanaphothrips clarus* distinct from, 403
- Chaetocnema aridula*, on maize in Soviet Union, 13
- Chaetocnema breviscula*, bionomics and control of, on beet in Bulgaria, 197
- Chaetocnema concinna*, bionomics and control of, on beet in Bulgaria, 197; insecticide control of, on sugar-beet in Britain, 386
- Chaetocnema heikertingeri*, damaging beet in Soviet Union, 194
- Chaetomium funicola*, development of stored-product insects on, 237
- Chaetopsis*, method for mass rearing of, under controlled environmental conditions, in Canada, 363
- Chaetorellia jaceae*, damaging *Carthamus tinctorius* in Israel, 636
- Chaitophorus populellus*, on *Populus* in Wyoming, nuisance of honeydew from, and insecticides against, 26
- Chamaecyparis*, *Argyresthia trifasciata* on, in Switzerland, 95
- Charcoal, as carrier for phorate, against *Thrips tabaci* and *Phytomyza atricornis*, 584
- Charipis*, hyperparasitism by, reared from *Anuraphis plantaginea* on apple in Holland, 121
- Chasmodon apterus*, attacking *Oscinella frit* in Britain, 467
- Cheesecloth, in artificial oviposition device for *Rhagoletis pomonella*, 286
- Cheimophila salicella*, control of, on blueberries in British Columbia, 267
- Cheletomimus berlesii*, predacious on other mites in Chile, 47
- Chelidurella acanthopygia*, records of, infesting textiles in Germany, 521
- Chelifer*, not harmful to bees, 394
- Chelisoches morio*, preying on *Brontispa* sp., in New Caledonia, 560
- Chelonus*, determination of, in *Spodoptera frugiperda*, in Louisiana, 500
- Chelonus striatigenus*, establishment of, against *Nacoleia octasema* on banana in Fiji, 177
- Chemagro 25141 (see Fensulfothion)
- Chemagro 37289 (see O-Ethyl O-2,4,5-Trichlorophenyl Ethylphosphonothioate)
- Chemagro B-37344 (see Methiocarb)
- Chemosterilants, for Lepidoptera, 31, 35; for Trypetids, 51, 52; research on, in U.S.A. and Central America, 296 (see also individual names)
- Chenopodium amaranticolor*, infected by virus disease of artichokes, 106
- Chenopodium quinoa*, *Piesma quadratum* in relation to transmission of virus disease of, 59
- Chenopods, distinguishing characters of aphids fed on, 335
- Cherelles, Mirid nymphs reared on, 626
- Chermes*, suppression of use of, 55
- Cherry, *Rhynchaenus fagi* on, in France, 53; aphids on, in Poland, 96; *Rhagoletis cerasi* on, in Poland, 137; *Prospaltella perniciosi* parasitising *Quadraspidiotus perniciosus* on, in France, 225; infested by *Neurotoma flaviventris* in Yugoslavia, 257; insect injury to, in Wisconsin, 270; *Rhagoletis cerasi* on, in Rumania, 328; *Pelecomalium testaceum* on flowers of, in British Columbia, 421; *Rhynchaenus fagi* on, in Germany, 456; *Rhagoletis cerasi* on, in Poland, 514; damaged by *Argyresthia ephippella* in Soviet Union, 553; natural mortality of *Rhagoletis cerasi* infesting, in Switzerland, 617
- Cherry, Barbados (see *Malpighia glabra*)
- Cherry, Bird (see *Prunus padus*)
- Cherry, Black (see *Prunus serotina*)
- Chervil (see *Anthriscus*)
- Cheyletus eruditus*, use of, against stored-grain mites in Czechoslovakia, 200; destroyed by fumigants against stored-grain mites in Czechoslovakia, 201
- Cheyletus malaccensis*, attacking eggs of *Lasioderma serricorne* in India, 399
- Chickweed (see *Stellaria media*)
- Chicory, *Aletia oxygala luteopallens* on, in Quebec, 50; evaluating damage to, by *Phytomyza lateralis* and *Tylomyza pinguis* in the forcing bed in Belgium, 575
- Chile, natural enemies of pests in, pests of apple in, 47; *Nabiseius duplicisetus* sp.n. on grapes from, 343; notes on recently identified insects in, 377; parasites of *Deltocephalus glaucus* on grape vines and weeds in, 378; pests limiting production of clover seed in, 408; *Tephromyiella neuquenensis* parasitising grasshoppers in, 409
- Chilo agamemnon*, tests with antifeeding compounds against larvae of, on maize in Israel, 339
- Chilo auricilius*, tests of isobenzan and other insecticides against, in India, 479
- Chilo fuscidentalis*, on bamboo in West Java, 178
- Chilo infuscatellus*, tests of isobenzan and other insecticides against, in India, 479
- Chilo partellus*, insecticides against, on sorghum in India, 262; on maize and sorghum in Somalia, 380; fecundity of, on maize, sorghum and sugar-cane in India, 440; in Africa, 481
- Chilo polychrysa*, in Asia, 481; bionomics and control of, in Malaya, 527
- Chilo suppressalis*, insecticides against, on rice in Formosa, 48; *Spathius helle* as parasite of, in Philippines, 60; factors affecting rearing of, 87; effect of rice varieties on infestation

- by, in Japan, nutritional relations of rice plant with; soil application of  $\gamma$  BHC against, on rice in Japan, **147**; cell migration from explanted tissues of diapausing larvae of, **180**; tissue culture of, **180**; resistance to parathion in, **315**; effects of insecticide treatments against, on maize in Egypt, **472**; in Asia, **481**;  $\gamma$  BHC against, harmful to freshwater fish in rice-fields in Philippines, **494**; morphology and *in vitro* cultivation of haemocytetes of, **572**; insecticides against, on rice in Philippines, **615**
- Chilocorus bipustulatus*, as predator of coccids on *Citrus* in Israel, rearing of, **258**; parasites of, population fluctuations of, on orange in Israel, **390**; establishment of, in olive groves in California, **543**
- Chilocorus nigritus*, predacious on *Aphis sacchari* and *Aphis indosacchari* in India, **479**
- China, *Nephotettix* sp. in, **87**; *Pseudaletia separata* in, pests of cotton in, **88**; *Melolontha melolontha* on cereals, vegetables and forest trees in, **89**; predicting locust population fluctuations in, **219**; *Bonnetia compta* parasitising *Agrotis* spp. in, **220**; hybridisation between *Dendrolimus* spp. in, **220**; *Leguminivora glycinivorella* on soy bean in, **220**; *Nausinoe geometralis* on *Jasminum* in, **220**; environmental factors affecting hatching of *Locusta migratoria manilensis* in; varietal resistance in soy bean to *Leguminivora glycinivorella* in; *Ostrinia nubilalis* and *Proceras venosatus* on maize in, **221**; *Brevicoryne brassicae* and mosaic virus disease of *Brassica pekinensis* in; *Sympiezomias lewisi* on *Citrus* in, **222**; *Porphyria parva* attacking *Ziziphus jujuba* in; residues of demeton on apples in, **238**; *Toxoptera citricida* transmitting yellow-shoot disease of *Citrus* in, **263**; *Agrotis ipsilon* on maize in; *Callosobruchus maculatus* attacking legumes in, *Phthorimaea operculella* infesting stored potatoes in; *Matsumuraea phaseoli* attacking leguminous crops in, **264**; *Earias* spp. on cotton in; *Nola distributa* on walnut in, **265**; egg-masses of *Ostrinia nubilalis* in maize fields in; nuclear polyhedrosis of *Pseudaletia separata* in; infestation and parasites of *Aporia crataegi* on apple in, **439**; *Homoeosoma nebulella* on *Helianthus annuus* in; infra-red irradiation of overwintering larvae of *Pectinophora gossypiella* in, **463**; *Andraca bipunctata* on tea in, **482**; *Athalia rosae ruficornis* on crucifers in; *Eurydema ornatum chloroticum* on vegetables in; *Stomopteryx subsecivella* on soy bean and groundnut in, **483**; new record of *Fiorinia turpiniae* in, **523**; diseases and pests of economic plants of, **528**; *Oryzaephilus surinamensis* in, **601**
- China Aster (see *Callistephus chinensis*)
- Chirke Disease, aphids transmitting virus of, to wheat and cardamom in India, **317**
- Chirothrips manicatus*, measures against, on grasses in Germany, **101**
- Chlamisus cribripennis*, bionomics and control of, on blueberry in Nova Scotia, **581**
- Chloethrips oryzae*, distribution map of, **617**
- Chloramine-T, estimation of malathion by oxidation with, **464**
- Chlorbenseide, not harmful to beneficial insects, **123**; in sprays against *Tetranychus telarius*, **232**; and carbaryl, effect of, in combined sprays against cotton worms and spider mites, **474**
- Chlorbicyclen, effectiveness of, against stored-product beetles, **513**
- Chlordane,  $\gamma$  isomer of, as constituent of technical heptachlor, **32**; persistence of, in soil, **45**; trunk and soil treatments with, in sprays against wood-borers, **135**; residues of, in plants, **137**; decline in residues of, applied in sprays to lucerne, **156**; in baits against *Melanoplus* sp., **161**; alone or with heptachlor, soil treatment with, in granules against *Scapteriscus acletus*, **207**; toxicity of, to *Heterotermes indicola*, **216**; toxicity of, to *Tribolium castaneum* and *Sitophilus oryzae*, **217**; against *Heteronychus arator*, **222**; toxicity of, to *Sitophilus oryzae*, and *Tribolium castaneum*, **261**; in sprays against *Pediasia* spp., **269**; soil treatment with, against *Conoderus* spp., **274**; toxicity of, to adults and larvae of *Dacus cucurbitae*, **316**; in dusts, soil treatment with, against Tipulid larvae, **329**; toxicological and pharmacological properties of, **346**; effects of soil types on, against *Trinervitermes trinervoides*, **395**; effectiveness of, in stored pine sapwood against termites, **408**; in dusts against *Galerucella birmanica*, **440**; persistence of, in soil for control of subterranean termites; bioassay of, using *Coptotermes formosanus*, **578**; against *Tropinota squalida* and *Epicometis hirta*, **610**; for protection of freshly felled timber in storage against insect borers and subterranean termites, **615**; distribution of, in soils following application by soil injector rod, **640**
- Chlordecone, chemical definition of, **1**; treatment of woollen fabric with, against *Anthrenus* and *Attagenus*, **33**; toxicity of, to *Spodoptera littoralis*, **84**; seed treatments with, against *Lissorhoptrus oryzophilus*, **161**; and oil emulsion, in sprays against Coccids, **207**; in granules against *Pediasia* spp., **269**; applied to soil in bait against *Conoderus* spp., **274**; in baits for *Pogonomyrmex occidentalis*, **486**; insect toxicity of alcoholic analogues and amine adducts of, **507**, **508**
- Chlordene, structure-activity relationships among insecticidal compounds derived from, **296**
- Chlorfenson, effect of, on beneficial insects, **122**; with prothoate, in sprays against mites and aphids not harming *Prospaltella perniciosi*, **123**; toxicity of, to *Tetranychus cinnabarinus*, **164**; resistance to, in *Tetranychus telarius*, **266**; against *Tetranychus telarius*, **319**, **350**; in sprays against *Stomacoccus platani*, **486**
- Chlorfenvinphos, chemical definition of, **1**; against *Hylemya brassicae*, **36**, **80**; topical and soil applications of, against *Eleodes suturalis*, **270**; in drenches, granules and seed treatment with, against *Hylemya antiqua*, **356**; guide to, **452**; residue analysis and



- screening of, by gel diffusion, **465**; against *Hypera variabilis*, **497**
- Chlorobenzilate, against *Panonychus ulmi*, **26**; toxicity of, to *Coccinella septempunctata*, **85**; against *Phyllocoptruta oleivora*, **269**; toxicity of, to *Oligonychus indicus*, **318**; alone and with Zineb or Thioquinox, in sprays against *Tetranychus cinnabarinus*, **337**; in sprays against *Panonychus ulmi*, **381**; mist-blowing of, against *Calacarus carinatus*, **398**; and carbaryl, effect of, in combined sprays against cotton worms and spider mites, **474**
- Chloro-Bidrin (see Dimethyl-1-Dimethylcarbamoyl-2-chloro-1-propen-2-yl Phosphate)
- Chlorochroa sayi*, damage to wheat by, in Canada, **312**
- Chlorocide (see Chlorbenside)
- 3-Chloro-6-cyano-2-norbornanone O-(Methylcarbamoyl)oxime, against *Panonychus ulmi*, **26**; against *Tetranychus telarius*, **164**; guide to, **452**; against *Psylla pyricola*, **643**
- 6-Chloro-3,4-dimethylphenyl N-Methylcarbamate (see Chlorxylam)
- P-Chloro-2,4-dioxo-5-methyl-P-thiono-3-phosphabicyclo [4.4.0] decane, in sprays against *Myzus persicae*, **166**; in sprays against *Heliothis zea*, **486**
- 2-Chloro-ethyl 2-(2-(p-tert.-Butylphenoxy)isopropoxy)isopropyl Sulphite, against *Tetranychus telarius*, **164**
- Chloroform, use of, in separating dimethoate from its oxygen analogue, **94**; used in extraction of malathion residues from fruits, **187**; as solvent for constituents of cotton bud, **281**; (as fumigant), in mixtures with other fumigants against pests of stored products, **542**; use of, in extraction of rice bran, **548**
- Chloro-IPC (see Isopropyl 3-Chlorophenylcarbamate)
- 4 (or 5)-Chloro-2-methyl-cyclohexane-carboxylic acid, esters of, combined with toxicant in traps for *Ceratitis rosa* and *C. capitata*, **130**
- Chloromycetin, treatment of soil with, **28**
- S-(6-Chloro-2-oxobenzoxazolin-3-yl) methyl Diethyl Phosphorothiolothionate (see Phosalone)
- 5-Chloro-6-oxo-endo-2-norbornanecarbonitrile O-(Methylcarbamoyl)oxime (see 3-Chloro-6-cyano-2-norbornanone O-(Methylcarbamoyl)oxime)
- N'-(4-chlorophenyl)-N,N-dimethylurea, and insecticides, effects of, on cotton seedlings, **596**
- p-Chlorophenyl 2,4,5-Trichlorophenyl Sulphide (see 2,4,5,4'-Tetrachloro diphenyl Sulphide)
- Chloropicrin, as fumigant, against insects infesting bagged foodstuffs, **215**; fumigation with, against *Callosobruchus maculatus*, **264**; residues of, in fumigated food commodities, **375**
- Chloropropylate, chemical definition of, **1**; not effective against *Panonychus ulmi*, **284**
- Chlorops pumilionis*, injuriousness of, to wheat in Bulgaria, **197**; varietal susceptibility of barley and oats to, in Rumania, **462**
- Chloropulvinaria*, distinguishing characters of, **460**
- Chloropulvinaria floccifera*, comparison of, with *Eupulvinaria hydrangeae*, **460**
- 6-Chloro-3,4-xylyl N-Methylcarbamate (see Chlorxylam)
- Chlorthiepin (see Endosulfan)
- Chlorthion, susceptibility of *Dermestes* to, **78**; in sprays against Lepidoptera and *Icerya purchasi*, **135**; in sprays against *Eurygaster integriceps*, **144**; against *Tribolium* spp., **254**; and Isolan, against *Drosophila melanogaster*, **599**; persistence of deposits of, used in sprays against stored-product beetles, **622**
- Chlorxylam, chemical definition of, **1**; toxicity of, to insects and mites, **186**; swollen abdomens in *Cydia molesta* treated with, **276**; in sprays against *Argyrotaenia velutinana*, persistence of, on grape foliage, **358**
- Cholam (see Sorghum)
- Cholesterol, utilization of, by *Melanoplus bivittatus*, **43**; attractiveness of, to *Eurytoma roddi*, **57**; in diet for *Ips calligraphus*, **209**; in diet for *Diatraea saccharalis*, **268**; in diet for *Anthrenus flavipes*, **441**; in diet for *Tribolium* spp., **503**
- Cholesteryl Benzoate, in diets for *Macrosiphum pisum*, **66**
- Cholesteryl Acetate, utilization of, by *Melanoplus bivittatus*, **43**
- Cholesteryl Chloride, utilization of, by *Melanoplus bivittatus*, **43**
- Choline chloride, in diet for *Ips calligraphus*, **209**
- Cholinesterases, action of phosphorus compounds on, **13**; inhibition of, by SD 9129, **28**; factors affecting inhibition of, **117**; structure of carbamates in relation to inhibition of, **186**; effects of alkylthiophenyl methylcarbamates on, **373**; action of carbamate insecticides on, **420**
- Choristoneura fractivittana*, changes in population of, on apple in Ontario, **201**
- Choristoneura fumiferana*, on *Abies* and *Picea* in British Columbia, studies in sampling larval stages of, **18**; factors affecting progeny variation in, **22**; artificial diet for, **23**; parasitism during decline of outbreaks of, on *Abies balsamea* in Quebec, **152**; role of chemotactic stimuli in feeding behaviour of, on *Picea glauca*, **158**; damage by, to immature balsam fir in Quebec, **201**; balsam fir killed by, in Canada, **309**; *Apanteles absonus* and *Clinocentrus fumiferanae* spp.n. parasitic in, in U.S.A., **463**; dusts of diatomaceous earth tested against, on *Pseudotsuga menziesii* in New Mexico, **498**; parasitism by *Trichogramma minutum* during outbreak of, on fir and spruce in Maine, **646**
- Choristoneura lambertiana subretiniana*, bionomics of, on pine in U.S.A., **347**
- Choristoneura murinana*, control of, on *Abies alba* in Germany, **379**; comparative effectiveness of *Bacillus thuringiensis* and DDT in sprays against, on spruce in Czechoslovakia, **430**; attacking fir in Czechoslovakia, **517**; forecasting and control of, on fir in Germany, **563**; effect of forest structure on outbreaks of, on silver fir in Czechoslovakia, **631**
- Choristoneura rosaceana*, changes in population of, on apple in Ontario, **201**
- Chorizagrotis auxiliaris*, migratory potential of, **302**

- Chorizococcus rostellum*, feeding on *Cyperus esculentus* in Hawaii, 175
- Chortoicetes terminifera*, sexual maturation, breeding and oviposition behaviour of, in New South Wales, 266; winter mortality of in Australia, 266
- Chromatography, determination of chemicals by, 39; separation of insecticide residues and mixtures by, 93, 94; of 2,4-dinitrophenylhydrazones, determination of pyrethrins by; for detection of phosphorothiono insecticides, 404; separation of insecticides by thin-layer technique of, 464; of rotenone and related compounds, 524 (see also Paper and Gas Chromatography)
- Chromium, in mixture against termite attack on beech and pine, 408
- Chrotogonus trachypterus*, attacking groundnut in India, 216
- Chrysanthemum cinerariaefolium*, *Thrips nigropilosus* on, in Kenya, 213; sprays not affecting, 263; *Aphidius matricariae* controlling *Myzus persicae* on, in Britain, 507; *Myzus persicae* on, in Britain, 533
- Chrysis*, *Spatulifimbria castaneiceps* parasitised by, on castor, 260
- Chrysocharis boops*, as synonym of *Chrysocharis nitetis*, 525
- Chrysocharis nitetis*, *Chrysocharis boops* as synonym of, parasitising *Coleophora laricella*, 525
- Chrysocharis gemma*, *Nepticula heringella* parasitised by, in Sicily, 610
- Chrysocharis seiuncta*, ineffective as parasite of *Haplodiplosis equestris* on cereals in Germany, 100
- Chrysomela americana*, bionomics and food plants of, control measures for, infesting rosemary in Italy, 331
- Chrysomela banksi*, *Doryphorophaga doryphorae* reared on, 459
- Chrysomela crotchii*, bionomics of, parasitism and predation in, on *Populus tremuloides* in Ontario, 311
- Chrysomela menthastri*, *Doryphorophaga doryphorae* reared on, 459
- Chrysomela varians*, responses of, to humidity, 571
- Chrysomphalus dictyospermi*, on *Citrus* in Italy, 94; on orange in Sicily and Sardinia, 95; *Aphytis africanus* sp.n. reared from, in South Africa, 130
- Chrysomphalus ficus*, *Aphytis africanus* sp.n. reared from, in South Africa, 130; parasitism by *Pseudhomalopoda prima* of, sprays against, on *Citrus* in Florida, 207; new insecticides against, on *Citrus* in Florida, 208; parasitised by *Chilocorus bipustulatus*, 258; *Aphytis lingnanensis* parasitic in, on watermelons in South Africa; parasitised by *Aphytis holoxanthus* in South Africa, 395; parasitised by *Habrolepis fanari* sp.n., in North Africa and Middle East, 462; mineral oils alone or with malathion against, on *Citrus* in Egypt, 473
- Chrysopa*, species of, as predator of *Panonychus citri* in Formosa, 315; insecticides harmful to, predacious on pests of peach in Ontario, 352; preying on *Heliothis zea*, 582
- Chrysopa carnea*, predacious on *Psylla pyricola* in California, 38; method for feeding artificial diets to, 55; preying on *Ostrinia nubilalis* on maize in U.S.A., 275
- Chrysopa intima*, predacious on eggs of *Gastrolina thoracica* in Soviet Union, 11
- Chrysopa oculata*, predacious on eggs of *Heliothis zea* in Arkansas, 416
- Chrysopa perla*, predacious on aphids in Poland, 97
- Chrysopa plorabunda*, predacious on eggs of *Heliothis zea* in Arkansas, 416
- Chrysopa rufilabris*, predacious on eggs of *Heliothis zea* in Arkansas, 416
- Chrysophana placida*, infesting log house in British Columbia, 420
- Chrysoteuchia culmella*, as earlier name for *C. hortuella*, 230
- Chrysoteuchia hortuella*, *C. culmella* as earlier name for, 230
- Chupons, of cacao, Mirids reared on, 626
- Cicer arietinum*, *Pachymerus chinensis* reared on, 238
- Cichorium intybus* (see Chicory)
- Ciconia ciconia*, as predator of *Nomadacris septemfasciata* in Tanganyika, 627
- Cidial (see Phenthoate)
- Cidial 50, containing phenthoate (q.v.), 5
- Cinara*, ants associated with, 152; reducing growth of seedlings of *Pseudotsuga menziesii* in Washington State, 152
- Cinara bogdanowi*, on spruce in Germany, 99
- Cinara piceae*, on spruce in Germany, 99
- Cinara pilicornis*, on spruce in Germany, 99
- Cinara pseudotaxifoliae*, species attacking *Pseudotsuga menziesii* identified as, 152
- Cinara pseudotsugae*, species attacking *Pseudotsuga menziesii* identified as near, 152
- Cinara taxifolia*, species attacking *Pseudotsuga menziesii* identified as near, 152
- Cinara watsoni*, bionomics of, on pine in Arkansas, effect of temperature on development of, 303
- Cinematography, of *Ostrinia nubilalis*, 404
- Cinerins, as constituent of pyrethrum, 112
- Cinamonum, *Zeuzera indica*, on, 178
- Cipollini (see *Muscari comosum*)
- Cirrospilus pictus*, parasitising *Coleophora laricella*, 525
- Cirrospilus vittatus*, *Nepticula heringella* parasitised by, in Sicily, 610
- Cirsium arvense*, flowering of, in relation to *Hyponomeuta padellus malinellus*, 97; infected by virus disease of artichokes, 107; potential use of *Ceutorhynchus litura* against, in, Canada, 616
- Cirsium setosum*, eradication of, for control of *Agrotis ipsilon* on maize in China, 264
- cis-7-Dodecen-1-ol Acetate, sex attractant of *Trichoplusia ni* identified as, 647
- Citrus*, *Lachnosterna bruneri* on, in Florida, 47; experiments with *Toxoptera citricida* as vector of tristeza virus of; *Coccus pseudomagnoliarum* on, in U.S.A., 60; aphids and tristeza disease of, 84; parasites of Coccid pest of, in India, 86; Coccids on, in Italy, 94; aphids on, in Italy, 103; predators of *Aonidiella aurantii* on, in South Africa; *Ceratitis* spp. on guava as source of infestation for, in South Africa,



- 129; *Aphytis* spp. attacking Coccids on, in South Africa, 130; effect of oil on persistence of insecticides determined by bioassay of; insecticide deposition on, 132; insect pests of, in Malta, 135; *Aleurocanthus woglumi* on, in Barbados, 172; scale insects on, in Florida, 207, 208; *Diaprepes abbreviatus* on, in Florida, 210; mites of subfamily Phytoseiinae on, in Guatemala, 211; *Papilio demoleus* on, in India, 216; *Sympiezomias lewisi* on, in China, 222; fruit-flies on, in Brazil, 241; *Ceratitis capitata* on, in Tunisia; factors limiting infestation of, by *Ceratitis capitata* in Tunisia, 244; *Ceroplastes sinensis* migrating from, to pear in Italy, 246; Coccids on, in Sicily; *Phyllocoptruta oleivora* on, in Yugoslavia, 257; *Chilocorus bipustulatus* as predator of Coccids on, in Israel, 258; yellow-shoot virus of, transmitted by *Toxoptera citricida* in China, 263; *Panonychus citri* on, in California, 269; mites on, in Venezuela, 287; aphids on, in Venezuela, 301; *Eurytoma fellis* and *Musgraveia sulciventris* on, in New South Wales and Queensland, 314; *Phyllocoptruta oleivora* and *Tegolophus australis* sp.n. on, in New South Wales; *Panonychus citri* on, in Formosa, 315; *Aculus pelekassi* and *Phyllocoptruta oleivora* on, in Italy, 331; *Tetranychus cinnabarinus* on, in Lebanon, 337; *Toxoptera citricida* on, in South Africa, 338; *Ceratitis capitata* on, in Argentina; pests and diseases of, in Argentina and Uruguay, 376; pests of, in Somalia, 380; mites on, in Portugal, 386; insect-transmissible virus of, related to greening in South Africa, 396; *Orthezia praelonga* attacked by fungi on, in Brazil, 461; Coccids on, in Egypt, 473; *Dasyneura citri* feeding on flower buds of, in India, 478; pests of, in Philippines, 480; Coccids on, in Iran, 519; pests of, in Florida; *Anastrepha ludens* as potential pest of, in Florida, 543; winter mortality of *Unaspis yanonensis* on, in Japan, 548; race of *Contarinia citri* damaging flowers of, in Sicily, 606; *Cryptolaemus montrouzieri* controlling *Planococcus citri* on, in Sicily, 607; *Cryptoblabes gnidiella* on, in Sicily; *Gymnoscelis pumilata* on, in Sicily, 608; *Cadra cautella* on, in Sicily, 609; effects of carbaryl on insect fauna of, in Italy, 628; recorded aphid vectors not transmitting tristeza virus of, in Israel; *Contarinia citri* on, in Israel; parasitic Hymenoptera on Homoptera attacking, in Israel, 636; *Ollarianus strictus* and *Lymaenon marylandicus* reared from, in Texas, 648
- Citrus bigaradia*, as source of *Ceratitis capitata* in Tunisia, 244
- CL-43064 (see 2-(Diethoxyphosphinothioylimino)-1,3-dithiolane)
- Cladius pectinicornis*, bionomics and control of, in Bulgaria, 556
- Clania crameri*, record of, in India, 262
- Clausenia josefi* sp.n., reared from *Planococcus* sp. infesting grape vine in Israel, 257
- Clausenia purpurea*, key separating *C. josefi* sp.n. from; use of, against *Pseudococcus citriculus* on *Citrus* in Israel, 258
- Cleasel, as attractant for *Dacus* spp., 214
- Clementine, *Aculus pelekassi* on, in Italy, 331
- Cleonus*, on beet in Iran, 519
- Cleonus bipunctatus*, damaging beet in Soviet Union, 194
- Cleonus brevirostris*, on beet in Iran, 519
- Cleonus declivis*, damaging beet in Soviet Union, 194
- Cleonus hexagrammus*, damaging beet in Soviet Union, 194
- Cleonus hortensis*, damaging beet in Soviet Union, 194
- Cleonus humeralis*, damaging beet in Soviet Union, 194
- Cleonus piger*, damaging beet in Soviet Union, 194
- Cleonus punctiventris*, ecology, fecundity and control of, in Soviet Union, 195; factors affecting efficiency of insecticides against, on sugar-beet in Rumania, 461
- Cleonus salebrosicollis*, damaging beet in Soviet Union, 194
- Cleonus securus*, damaging beet in Soviet Union, 194
- Cleptes nigritus*, parasitising *Periclista andrei* on oak in Portugal, 295
- Cleptes semiauratus*, parasitising *Pristiphora abietina* on spruce in Germany, 566
- Clinocentrus fumiferanae*, sp.n., parasitic in *Choristoneura fumiferana* in U.S.A., 463
- Closterocerus*, *Dicranoctetes saccharella* parasitised by, in Peru, 194
- Clouds, patterns of, outlining climatic areas in insect population studies, 346
- Clover, *Spodoptera littoralis* on, 83; Auchenorrhyncha and Heteroptera on, in Sweden, 345; *Heliothis zea* on, in Louisiana, 367; *Liriomyza* sp. and *Porphyrosela minuta* on, in Chile, 377; treatment of, against *Eurytoma platyptera*, and other pests, in Chile, 408; thrips on, in Illinois, 497; effects of insecticides on, 552; growing points of, attacked by *Cnephasia longana* in Holland, 568; *Sitona* spp. on, in Israel, 612
- Clover, Crimson (see *Trifolium incarnatum*)
- Clover, Pink (see *Trifolium hybridum*)
- Clover, Sweet (see *Melilotus*)
- Clover, White (see *Trifolium repens*)
- Cnaphalocrocis medinalis*, distribution map of, 617
- Cnephasia longana*, control of, attacking growing points of plants in Holland, 568
- Cnephasia virgaureana*, record and control of, on beet in France, 226
- Cobalt (as plant nutrient), effect of, on fecundity of *Tetranychus telarius*, 274
- Cobalt, Radioactive, use of, in study on *Leptinotarsa decemlineata*, 14; use of, for protection of stored products against insects, 58; effect of  $\gamma$ -radiation from, on *Schistocerca gregaria*, 145; effect on *Platynota stultana* of  $\gamma$ -radiation from, 170; effects of  $\gamma$ -radiation from, on Coleoptera, 253; effects of  $\gamma$ -radiation from, on *Cydia pomonella*, 271; effect of  $\gamma$ -radiation from, on *Trogoderma glabrum*, 280;  $\gamma$ -radiation from, as quarantine treatment for Trypetids infesting fruit, 284; effect of  $\gamma$ -radiation from, on *Tribolium confusum*, 578; effects of  $\gamma$ -radiation from, on *Acarus siro*, 591; effect of  $\gamma$ -radiation from, on eggs and pupae of *Ephestia kuehniella*, 619

- Coccidophilus citricola*, preying on *Aonidiella aurantii* in Argentina, 376
- Coccids, control of, on crops in Italy, 390
- Coccinella*, survey of useful and injurious species of, in Iran, 614
- Coccinella novemnotata*, preying on *Ostrinia nubilalis* on maize in U.S.A., 275; predacious on eggs of *Heliothis zea* in Arkansas, 416
- Coccinella septempunctata*, in India, toxicity of, insecticides to, 85; natural enemies of, 104; effectiveness of, in suppressing population of *Aphis fabae* on beet in Czechoslovakia, 137; effect of temperature and humidity on development of, 214; bionomics of, in France, 344; suitability of aphids as food for, in Britain, 506; host-specificity and micro-distribution of, attacking aphids in France, 559; methods of rearing, 595
- Coccinella transversoguttata richardsoni*, in herbicide-treated oat fields in New Brunswick, 424
- Coccinella trifasciata*, preying on *Ostrinia nubilalis* on maize in U.S.A., 275
- Coccinella trifasciata perplexa*, in herbicide-treated oat fields in New Brunswick, 424
- Coccinellids, affected by chemical treatment of apple in Italy, 330; predacious on *Tetranychus cinnabarinus* in Lebanon, 337; growth and development of larvae of, on dry foods in Canada, 348
- Coccoidea, of Micronesia, 620
- Coccomyces hiemalis*, cherry leaf-spot caused by, 270
- Coccophagus caridei*, predacious on *Eulecanium persicae* and *Pulvinaria mesembryanthemi* in Chile, 377
- Coccophagus lycimnia*, parasitising *Toumeyella pinicola* in California, 164
- Coccus deliae*, as pest of *Citrus* in Argentina and Uruguay, parathion effective against, 376
- Coccus hesperidum*, parasites of, 60
- Coccus pseudomagnoliarum*, on *Citrus* in U.S.A., experiments on biological control of, 60
- Cockroaches, effect of carbon-dioxide anaesthesia on, 65; use of, in study of action of piperonyl butoxide and malathion, 462; in Britain, 571
- Cocoa (see *Theobroma cacao*)
- Coconut, in baits for *Rhynchophorus palmarum*, 42; insects recorded from, in S.E. Asia and Pacific Region, 56; *Nephantis serinopa* on, in Ceylon and India, 56; *Rhynchophorus palmarum* transmitting nematode causing red-ring disease of, in Trinidad, 70; development of *Rhynchophorus palmarum* in stumps of, in Trinidad, 172; *Rhadinaphelenchus cocophilus* causing red-ring disease of, 173; infestation of, by *Aspidiotus destructor* in New Hebrides, 223; *Spatulifimbria castaneiceps* reared from, 260; *Callispa* sp. on, in India, 261; *Oryzaephilus gibbosus* sp.n. found in cargo of, from East Africa, 295; *Oryctes rhinoceros* on, in India, 313; pests of, in India, 316; *Oryctes* spp. on, in Ivory Coast, 334; pests of, in Somalia, 380; lethal yellowing disease of, in Jamaica, 403; *Agonoxena* spp. on, 445; *Strategus jugurtha* on, in Brazil, 577; absence of red-ring disease in, under natural conditions, *Rhynchophorus palmarum* and red ring disease in, in Surinam, 639
- Coeloides brunneri*, material influences on diapause of; parasitising *Dendroctonus pseudotsugae*, 605
- Coffea arabica*, atlas of pests, diseases and deficiency syndromes of, in Kenya, 239; *Planococcus lilacinus* and associated ants on, in India, 614; (see also Coffee)
- Coffea canephora*, *Xylosandrus compactus* on, in India, 615
- Coffee, no breeding of *Sitophilus granarius* in, 5; *Epicampoptera strandi* on, in Ivory Coast, 108; atlas of pests and diseases of, in Kenya, 239; fruit-flies on, in Brazil; effect of BHC on flavour of, 241; biological control of pests of, 242; damage to, by *Bixadus sierricola* and *Athores leuconotus* in Angola, and stem and root treatment of, 245; *Quesada gigas* on, in Brazil, 299; *Hypothenemus hampei* on, in Brazil, 300; pests of, in India, 316; *Cerococcus catenarius* on, in Brazil, 403; *Antestia* and *Antestiopsis* spp. on, in Africa, 447; *Leucoptera coffeella* on, in Guatemala, 578
- Coffee, Arabica (see *Coffea arabica*)
- Coffee, Robusta (see *Coffea canephora*)
- Coffee (Stored), insecticide contamination of, through package material, 582
- Colaptes auratus*, as predator of *Zeadiatraea grandiosella* and *Ostrinia nubilalis*, 302
- Colaspis*, insecticides against, on banana in Venezuela, 47
- Colaspis flavida*, comparative preference of, for glanded and glandless cottons in Mississippi, 360
- Cold, resistance to, in *Euproctis chrysorrhoea* and *Lymantria dispar*, 434
- Cold-hardiness, of larvae of *Anastatus disparis*, 136; glycerol content and, in Lepidoptera, 423; of eggs of *Panonychus ulmi*, 424; in *Aeroglyphus robustus*, 495
- Cold Storage, effect of, on eggs and larvae of *Hypera variabilis*, 595
- Coleophora dahurica* sp.n., damaging larch in Soviet Union, 189
- Coleophora loricella*, damaging larch in Soviet Union, 189; distribution, bionomics, and natural enemies of, in Sweden, 525
- Coleophora malivorella*, effects of *Bacillus thuringiensis* and captan on, on apple in Wisconsin, 167
- Coleophora serratella*, effects of *Bacillus thuringiensis* and captan on, on apple in Wisconsin, 167
- Coleophora sibirica*, damaging larch in Soviet Union, 189
- Coleoptera, distribution of, on pine in Maryland, 304
- Coleotichus blackburniae*, use of, for rearing *Asolcus basalis* and *Ooencyrtus* spp. in Hawaii, 174
- Coleus*, *Planococcus citri* on, 160
- Colgar tricolor, attacking rubber trees in Territory of Papua and New Guinea, 480
- Colias eurytheme*, cytoplasmic-polyhedrosis virus of, 373
- Collards, varietal resistance to insect attack in, in Wisconsin, 275; persistence of dimethoate



- on, aphids on, in U.S.A., 363; varietal resistance of, to *Phyllotreta striolata* in North Carolina, 524
- Colletotrichum gloeosporioides*, infection of *Orthezia praelonga* by, in Brazil, 461; *Pro-lasioplera berlesiana* reared on, 637
- Collicularia microgrammana*, bionomics and control of, on lucerne in Bulgaria, 556
- Collops*, species of, predacious on eggs of *Heliothis zea* in Arkansas, 416
- Colloquium, International, on pathology of insects and microbiological control, 426
- Colobothra distincta*, bionomics of, on cacao trees in Costa Rica, 538
- Colocasia*, as ingredient in processed food bari, 399
- Colombia, *Diatraea saccharalis* damaging sugar-cane in, 171; pests of cotton in, 211; *Strategus aloeus* on oil palms in, 577
- Colorado, pests of spruce in, 67; holocyclic strain of *Therioaphis trifolii* on lucerne in, 493
- Colotois pennaria*, outbreak of, in Czechoslovakia, 380
- Colour, effect of, on artificial oviposition devices for *Rhagoletis pomonella*, 286; reaction of insects to, 338; preference for, in feeding behaviour of *Anthonomus grandis*, 490
- Colpoclypeus florus*, parasitic in *Archippus oporanus*, 330
- Columba livia*, organochlorine residues in, 400
- Columba palumbus*, organochlorine residues in, 400
- Columbine, *Pristiphora aquilegiae* on, in Ontario, 179
- Commiphora myrrha*, effect of, on sexual maturation in *Schistocerca gregaria*, 605
- Compound 1189 (see Chlordecone)
- Compound 4072 (see Chlorfenvinphos)
- Compsilura concinnata*, parasitising *Pieris rapae* in British Columbia, 594
- Conifers, tree planter attachments for chemical treatment of seedlings of, in Manitoba, 309; pests of, in Florida, development of *Hylobius abietis* on, in north Europe, 563
- Coniophora cerebella*, effect of, on resistance of *Pseudotsuga menziesii* to *Reticulitermes lucifugus*, 661
- Connecticut, Mirids attacking pests of apple in, 46; parasite of *Mycodiplosis alternata* on dogwood in, 69; *Neodiprion sertifer* in, 348; *Lymantria dispar* on oak in, 373; milky disease of *Popillia japonica* in, 427; control of *Lymantria dispar* on apple in, 491; *Lymantria dispar* reared on artificial diet in, 498
- Conocephalus propinquus*, infestation and control of, on rice in British Guiana, 172
- Conoderus*, control measures against, on crops in Texas, 364
- Conoderus falli*, control of, in sweet potatoes in North Carolina, resistance in, to cyclodiene insecticides, 274; control of, on potato in U.S.A., 463
- Conoderus vespertinus*, effects of temperature and moisture on survival of eggs of, 169; control of, in sweet potatoes in North Carolina, resistance in, to cyclodiene insecticides, 274
- Conotrachelus nenuphar*, O,O-diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate against, 160; insecticides against, on peach and plum in Ohio, 165; control of, in apple orchard in Wisconsin, 167; damage to sour cherry by, in Wisconsin, 270; damaging apples in Wisconsin, 279; mass rearing of, 286; function of stridulating organs of, in North Carolina, 540
- Contarinia*, sprays against, on *Pseudotsuga menziesii* in British Columbia, 421; species of, on sorghum in Uruguay, 640
- Contarinia citri*, race of, parasitised by *Inostemma walkeri*; damaging *Citrus* flowers in Sicily, 606; and its parasites, damaging *Citrus* in Israel, 636
- Contarinia lentis*, damaging lentil in France, 226
- Contarinia medicaginis*, tests of soil treatments against, on lucerne in Poland, 512; forecasting infestation by, on lucerne in Czechoslovakia, 631
- Contarinia nasturtii*, bionomics of, in Britain; effect of temperature and moisture and development of, in soil, 529
- Contarinia oregonensis*, insecticides against, on *Pseudotsuga menziesii* in Washington State, 44
- Contarinia palposa*, as synonym of *Contarinia sorghicola*, 640
- Contarinia pisi*, bionomics and control of, on pea in France, 226
- Contarinia sorghicola*, device for detection of larvae of, on sorghum in U.S.A., 35; bionomics of, parasites of, on sorghum in Italy, 389; *Contarinia palposa* as synonym of, 640
- Contarinia washingtonensis*, on *Pseudotsuga menziesii* in Washington State, 44
- Convolvulus arvensis*, *Hyalesthes obsoletus* on, in Bulgaria, 199
- Copidosoma geniculatum*, reared from pine infested by *Exotelea dodecella*, 98
- Copper, in mixture against termite attack on beech and pine, 408
- Copper Oxchloride, in sprays against mites and aphids not affecting parasitism by *Prospaltella perniciosi*, 123
- Copper Sulphate, and nicotine preparation in sprays against *Dacus cucurbitae*, 265
- Coptotermes*, in plantations in Uganda; not associated with damage to *Eucalyptus* in Uganda, 443
- Coptotermes acinaciformis*, use of, in tests of water-soluble wood preservatives, 408
- Coptotermes elisae*, attacking rubber trees in Territory of Papua and New Guinea, 490
- Coptotermes formosanus*, presence of, in Texas, 211; use of, in bioassay of soil insecticides in Hawaii, 587
- Coptotermes lacteus*, use of, in tests of water-soluble wood preservatives, 408
- Coraeus rubi*, bionomics of, on raspberry in Yugoslavia, 569
- Coraeus undatus*, control of, on *Quercus suber* in Spain, 255
- Corchorus*, pests of, in India, 316

- Corchorus capsularis*, *Apion corchori* on, in India, 213
- Corchorus olitorius*, *Apion corchori* on, in India, 213; *Anomis sabulifera* on, in India, 372
- Corcyra cephalonica*, reared on wheat flour, effects of calcium orthophosphate on, 50; infesting stored groundnuts in Nigeria, 110; rearing of, for mass production of *Trichogramma minutum*, 144; attacking stored rice in British Guiana, 172; *Trichogramma australicum* reared on, in Madagascar, 558; *Trichogramma fasciatum* reared on, 630
- Coreus marginatus*, as alternative host for parasites of *Eurygaster integriceps* in Soviet Union, 549
- Coriander Oil, as attractant for insect pests, 399
- Cork Oak (see *Quercus suber*)
- Cornus*, *Mycodiplosis alternata* on, in Connecticut, 69
- Corthylus flagellifer*, associated with cacao in Costa Rica, 375
- Cosmia diffinis*, on elm in Spain, 255
- Costa Rica, *Aleurocanthus woglumi* in, 172; mites of subfamily Phytoseiinae in, 211; *Verticillium lecanii* against *Saissetia hemisphaerica* on coffee in, 242; research on chemosterilants for control of insect pests in, 296; Scolytids and Platypodids on cacao in, 375; *Ceratitidis capitata* in, 375, 376; *Colobothra distincta* on cacao in, 538; *Ecpanteria icasia* on banana in, 645
- Cossus*, wood-boring species of, in Indo-Malayan region, 178
- Costelytra zealandica*, response to insecticides and chemical control of, in New Zealand, 176; *Metarrhizium anisopliae* isolated from, in New Zealand, 313; soil treatment tests with insecticides for control of, in New Zealand, 450; a review of research on, in pastures in New Zealand, 616
- Cothonaspis*, insecticides against *Hylemya brassicae* harmful to, in Belgium, 575
- Cotinis nitida*, evaluation of insecticides against, in North Carolina, 485
- Cotnion (see Azinphos-methyl)
- Cotoneaster*, *Rhopalosiphum fitchii* on, in Manitoba, 311
- Cotton (see also *Gossypium*)
- Cotton, *Locusta migratoria migratoria* on, in Soviet Union, 10; *Agrotis segetum* on, in Soviet Union, 16; toxicity of sesamex to, 28; pests of, in Texas, 30; *Lygus hesperus* on, in California, 37; in tests with feeding deterrent for *Anthonomus grandis*, 40; *Frankliniella occidentalis* on, in New Mexico, 43; *Heliothis zea* on, in Carolina; pests of, in U.S.A., 45; *Anthonomus grandis* on, in Mississippi, 46; *Pectinophora gossypiella* on, in U.S.A., 63; *Tetranychus cinnabarinus* on, in Turkey, 83; distribution of Mirids in fields of, in China, 88; pests of, in Iraq, 103; not damaged by *Acheta domesticus* and *Periplaneta americana*, 125; insect pests on, in Kenya, 134; *Tetranychus cinnabarinus* on, in Egypt, 164; effect of thrips on yield of, in Alabama, 165; pests of, in Alabama, 165, 166; *Encarsia lutea* parasitising Lepidoptera and Aleyrodids on, in Arizona, 168; *Heliothis* spp. on, in Louisiana, 168; *Diatraea saccharalis* migrating from, to sugar-cane in Colombia, 171; pests of, in Arizona, 171; predacious insects, spiders and mites on, in Arkansas, 179; pests of, in Soviet Union, 196; pests of, in Colombia, 211; effect of insecticides on yields of, 212; *Spodoptera littoralis* on, in Egypt, 213; insecticides increasing yields of, *Pectinophora gossypiella* on, in India, insecticides against pests of, in India, 215; *Spodoptera litura* on, in Western Australia, 222; effect of systemic insecticides on growth of, in Brazil, 242; *Alabama argillacea* on, in Brazil, 243; *Pectinophora gossypiella* on, in Spain, 256; hairiness of, favouring *Bemisia tabaci* in Sudan, 258; relationship between leaf hairiness and resistance to *Spodoptera littoralis* in, in Egypt, 258; *Earias cupreoviridis* and *E. fabia* on, in China, 265; *Spodoptera littoralis* on, in Egypt, 269; varietal susceptibility of, to *Anthonomus grandis*, 271; insect pests of, in North Carolina, and effects of low dosages of insecticidal seed treatments on, 272; damage to, by *Anthonomus grandis* in Mississippi, 273; low-volume spraying of, against *Anthonomus grandis* in Tennessee, 275; seasonal abundance of *Heliothis zea* and *H. virescens* on, in Georgia, 276; *Anthonomus grandis* on, treatment of, against pests in Texas, 278; pigments of, as source of resistance to *Heliothis* spp., 280; constituents of bud of, stimulating feeding by *Anthonomus grandis*, 281; *Diabrotica undecimpunctata undecimpunctata* reared on, 285; attractiveness of, to *Anthonomus grandis*, 286; pests of, in India, 316; *Tetranychus telarius* on, in Soviet Union, 319; spray distribution on, from helicopter and ground treatments, 334; effects of pests on quality of, *Anthonomus grandis* and *Heliothis zea* on, 355; pests of, metabolism of insecticides in, 357; *Psallus seriatus* on, in Texas, 358; *Anthonomus grandis* on, in Texas, 359; comparative preferences of insects for glanded and glandless varieties of, in Mississippi, 360; attractiveness of, to *Anthonomus grandis* in South Carolina, variety of, resistant to *Heliothis zea* and *Psallus seriatus* on, in Texas and Mississippi, 362; *Pectinophora gossypiella* on, in Texas, 365; *Heliothis zea* on, in Louisiana, 367; *Heliothis* spp. on, in Texas; *Aleyrodes spiraeoides* on, in California, 369; pests of, in Somalia, 380; *Pectinophora gossypiella* on, in Yugoslavia, 392; *Bemisia tabaci* associated with sooty mould on, in Central America, 401; predators of *Heliothis zea* on, in Arkansas, 416; *Spanogonicus albofasciatus* predacious on pests of, in Arizona, 417; effect of insecticides on fibre and yarn properties of, in Egypt; spraying equipment for, in central Africa, 441; effect of insecticides on yields in, in Uganda, 442; *Petrobia latens* on, in Queensland, 449; *Earias huegeli* and *Earias vittella* on, in Queensland, 450; *Spodoptera littoralis* on, in Egypt, 472; *Eyprepocnemis plorans* on, in Egypt, 473; aerial and ground spray treatments of, against insect pests in Rhodesia, *Spodoptera littoralis* and spider mites on, in Egypt, 474; *Pectinophora gossypiella* on, in Rhodesia and Malawi; *Pauro-*



- cephala gossypii* on, in Malawi; *Alcidodes haemopterus* on, in the Sudan, 475; feeding, oviposition and development of *Anthonomus grandis* on glandless varieties of, in Mississippi, 490; *Trichoplusia ni* and *Pseudoplusia includens* on, in Alabama, 498; *Anthonomus grandis* on, in Texas, 499; tomato viruses not transmitted to, 505; pests of, in Iran, 519; distribution on, of *Empoasca lybica* in Sudan, 529; feeding stimulant combined with nuclear-polyhedrosis virus against *Heliothis zea* on, 537; *Dysdercus* spp. on, in Florida, 543; measures against overwintering population of *Anthonomus grandis* on, in Mississippi, 580; infestation of *Heliothis* spp., and other insects on glanded and glandless strains of, in Texas, 581; attempted control of *Pectinophora gossypiella* on, by male annihilation in Mexico, systemic insecticides against pests of, in Texas, systemic activity of dimethyl 1-methyl-carbamoyl-1-propen-2-yl phosphate in, 589; *Anthonomus grandis* on, in Louisiana; *Frankliniella* sp., and *Psallus seriatus* on, in Texas, 591; stem treatment of, for control of *Lygus hesperus*, in Arizona, 595; effects of insecticides and herbicides on; winter mortality of *Anthonomus grandis* on, in South Carolina, 596; *Earias insulana* migrating from, to *Malva sylvestris* in Israel, 612; effect of *Bemisia tabaci* on, in Sudan Gezira, effect of *Empoasca lybica* on, in Sudan Gezira, *Dysdercus* spp. on, in Kenya, 624; insects and mites on, in Uganda, 625; harmful interaction between fungicides and systemic insecticides applied to, against thrips in Mississippi, 641; artificial diet based on squares of, for *Anthonomus grandis*, 645; development of *Heliothis zea* and *Spodoptera frugiperda* on, 649; pests of, in the Sudan, 656
- Cottonseed, in diet for *Anthonomus grandis*, 280; treatment of, damaged by insects and mites in Turkey, 614
- Cottonseed Oil, and dicofol, avoidance of russetting of apples by, 472
- Cottonseed Protein, in bait for *Anastrepha ludens*, 499
- Cottonwood (see *Populus*)
- Couch-grass (see *Agropyrum repens*)
- Coumaphos, effects of humidity on persistence of, 47; against *Dermestes* spp., triphenyl phosphate as synergist for, 254
- p-Coumaric Acid, effects of, on termites, 406
- Coumarin, repellent to *Eurytoma roddi*, 57; damage caused by *Empoasca fabae* in relation to, in sweet clover, 498
- Coumoestrol, attractive to *Eurytoma roddi*, 57
- Cowpeas (see *Vigna unguiculata* [catjang])
- CP40294 (see O-Phenyl O-p-Nitrophenyl Methylphosphonothioate)
- Crambus culmellus*, *Agriphila straminea* previously referred to as, 230
- Cranberry Bogs, persistence of dieldrin in, in Massachusetts, 586
- Crataegus*, *Saissetia oleae* on, in Greece, 52; *Rhopalosiphum fitchii* on, in Manitoba, 311; *Lithocolletis corylifoliella* on, in Holland, 568
- Crataegus azarolus*, *Ceratitis capitata* on, in Tunisia, 244
- Cratichneumon nigrivarius*, effect of insecticide dusts on parasitism by, in *Bupalus piniarius* in Soviet Union, 190
- Crawfish, Louisiana Red (see *Procambarus clarkii*)
- Crematogaster lineolata*, destroying other insects in Virginia, 34
- Creolin, soil treatment with and in dusts, against *Hylemya* spp., 511
- Creosote, against *Enarmonia formosana*, 230
- Crickets, in Britain, 571
- Crimson Clover (see *Trifolium incarnatum*)
- Crotalaria juncea*, pests of, in Rhodesia, 74
- Crotonic Acid, as metabolite of Bidrin, 28
- Crucifers, pests of, in Britain, 386; *Trichoplusia ni* and *Pseudoplusia includens* on, in Alabama, 498; oesophageal and stomach inclusions of aphids feeding on, 600
- Cryolite, unsatisfactory against *Spodoptera littoralis*, 84
- Cryptoblabes gnidiella*, bionomics and control of, on Citrus in Sicily; associated with infestation by *Planococcus citri*, 608
- Cryptognatha nodiceps*, not successful against *Aspidiotus destructor* in New Hebrides, 224
- Cryptolaemus montrouzieri*, against *Planococcus citri* on Citrus in Sicily, 607
- Cryptolestes capensis*, factors affecting development of, 4
- Cryptolestes ferrugineus*, effects of gaseous tensions on mortality of adults of; intrinsic rate of natural increase of, 4; infesting stored groundnuts in Nigeria, 110; fumigants against, destroying *Cheyletus eruditus* in stored grain in Czechoslovakia, 201; development of, on seed-borne fungi, 236; feeding and oviposition of, on seed-borne fungi, 540; attacking stored sunflower seeds in Yugoslavia, 602
- Cryptolestes lasilloides*, factors affecting development of, 4
- Cryptolestes pusillus*, association of, with storage fungi, 623
- Cryptolestes turcicus*, factors affecting development of, 4; in Britain, effect of temperature on, in flour mills, 77; abundance of, in machinery of flour mill in Britain, 504
- Cryptolestes ugandae*, factors affecting development of, 4
- Cryptophlebia leucotreta*, DDT applied by hand-operated spraying machines against, on cotton in Uganda, 625
- Cryptorhynchus lapathi*, insecticides against, on poplar in Italy, 94
- CTAB (see Cetyl Trimethyl Ammonium Bromide)
- Ctenicera destructor*, sex attractants in extracts of unfertilized females of, 204; effect of structural analogues of methionine and glutamic acid on larvae of, 624
- Ctenicera lobata*, damaging potato in Quebec, 157
- Ctenicera silvatica*, sex attractants in extracts of unfertilized females of, 204
- Ctenicera tarsalis*, damaging potato in Quebec, 157
- Ctenocephalides canis*, records of, infesting textiles in Germany, 521

- Ctenopelma*, parasitising *Cephalcia fascipennis* on spruce in Canada, 153
- Cuba, *Aleurocanthus woglumi* in, 172
- Cucumber, virus disease of, in California, 71; virus disease of, not infecting artichokes, 107; *Tetranychus telarius* on, in Norway, 181; *Tetranychus telarius* on, in Britain, phytotoxic effect of acaricides on, 230; effects of soil applications of DDT and aldrin on, 231; *Phytoseiulus persimilis* controlling *Tetranychus telarius* on, in Britain, 236; *Bemisia tabaci* transmitting vein yellowing virus of, in Israel, 237; *Tetranychus telarius* on, in Rumania, 247;  $\gamma$ -radiation as quarantine treatment of, 284; *Acalymma vittatum* on, in Kansas, 343; control of *Tetranychus telarius* on, in Ontario, 350; as ingredient in processed food bari, 399; *Myzus persicae* and virus disease of, in Hawaii, 495; *Diabrotica* spp. on, in U.S.A., 543; *Epilachna chrysomelina* on, in Sicily, 609; treatment of, against mildew and *Tetranychus telarius* in Holland 652, 653
- Culex pipiens*, use of, for determination of insecticide residues, 473
- Culex pipiens fatigans*, insecticidal activity of alkylthiophenyl methylcarbamates in, 373; used in tests of effects of structure on biological activity of phenyl methylcarbamates, 420
- Cultural Practices, effects of, on *Oscinella frit*, 13; effect of, on Thysanoptera, 102
- Cupressus*, control measures for, against *Oemida gahani*, in Kenya, 444
- Cupressus lusitanica*, attacked by *Coptotermes* in Uganda, 443
- Cupric Chloride, ineffectiveness of, as chemosterilant for *Ceratitis capitata*, 51
- Cupric Sulphate, surface sterilization of eggs of *Anthonomus grandis* with, 296
- Currant, Black, pests of, in Poland, 9; *Cecidophyopsis ribis* causing leaf deformation of, in Germany, 54; *Dasyneura tetensi* on, in Austria, Britain, Finland and Germany, 54; aphids on, in Poland, 96; *Archips rosanus* on, in Soviet Union, 191; *Cecidophyopsis ribis* on, in Britain, 385; *Pelecomalium testaceum* on flowers of, in British Columbia, 421; growth of, damaged by lime-sulphur and colloidal sulphur used against *Cecidophyopsis ribis* and reversion virus, in Britain, 470; *Thomasiniana ribis* on, in Poland, 512; *Aegeria tipuliformis* on, in Germany, 520; insects found in abandoned feeding sites of Tortricids on, in Poland, 603
- Currant, Red, pests of, in Poland, 9; *Pelecomalium testaceum* on flowers of, in British Columbia, 421; growing points of, attacked by *Cnephasia longana* in Holland, 568; insects found in abandoned feeding sites of Tortricids on, in Poland, 603
- Curvularia lunata*, isolated from *Oebalus poecilus* on rice, 638
- Curvularia tetramera*, feeding and oviposition of *Cryptolestes ferrugineus* on, 540
- Custard Apple (see *Annona squamosa*)
- Cutworms, population studies on, in Belgium, 576
- Cyamopsis tetragonoloba*, phytotoxic effects of insecticides used as seed, foliage or soil treatments on, 263
- Cyanamid 47300 (see Fenitrothion)
- Cyanidin, relation of *Pissodes strobi* to, in extracts of *Pinus strobus*, 452
- S-N-(1-Cyano-1-methylethyl)carbamoylmethyl Diethyl Phosphorothiolate (see Cyanthoate)
- Cyanthoate, chemical definition of, 2
- Cyclamen*, *Steneotarsonemus pallidus* on, in U.S.A., 543
- Cyclocephala signaticollis*, bionomics of and natural enemies of in Argentina, Australia and Uruguay, 47
- Cyclodiene, effects of, on susceptible and resistant strains of *Hylemya brassicae*, 489; susceptibility or resistance to, in *Hylemya brassicae*, 493
- Cycloheximide (see 3-(2-(3,5-Dimethyl-2-oxocyclohexyl)-2-hydroxyethyl)glutarimide)
- Cycloneda sanguinea*, preying on *Ostrinia nubilalis* on maize in U.S.A., 275
- Cydia conicolana*, on *Pinus sylvestris* in Britain, tit predation and other factors affecting populations of, 651
- Cydia funebrana*, insecticides against, on plum in Poland, 452; on plum in Poland, 453; comparison of *Trichogramma cacoeciae* and insecticides against, on plum in Poland, 454; effectiveness of *Trichogramma cacoeciae* for control of, on plum in Poland, 559
- Cydia leucostoma*, effects of sprays against other pests of tea on, in India, insecticide control of, on tea in India, 397
- Cydia molesta*, sprays against, on apple in France, 123; insecticide contamination of rooms and equipment used for rearing of, 275; swollen abdomens in adults of, treated with insecticides, 276; distribution of, in Europe and Mediterranean Basin, control methods used against, effects of, on fruit crops, 333; carbamate sprays in control of, on peach in Ontario, 352; on peach, 387; laboratory cage for sterilization studies with, 403
- Cydia nigricana*, losses caused by, on varieties of pea in Sweden, 181
- Cydia packardii*, damage to sour cherry by, in Wisconsin, 270
- Cydia pomonella*, effects of measures against other insects on, on apple in Italy, 6; on apple, pear and quince in Iran, insecticides against, 10; on pear in California, insecticides against, 38; fungal mortality of, in apple orchards in Nova Scotia, 56; toxicity of insecticides to, on apple in Britain, 75; on apple in Italy, 93; sprays against, not affecting *Typhlodromus pyri* on apple in Holland, 122; sprays against, on apple in France, 123; insecticides against, on fruit trees in Malta, 135; effect of *Bacillus thuringiensis* on, on apple in Wisconsin, 168; insecticides against, on apple in France, 227; combined control of *Zeuzera pyrina* and, in France, 228; attacking nuts of *Pinus halepensis* in Spain, 255; effects of  $\gamma$ -radiation from  $^{60}\text{Co}$  source on, 271; swollen abdomen in, treated with parathion, 276; damaging apples in Wisconsin, 279; carbaryl against, on apple in Italy,



330; integrated control of, on apple in Wisconsin, 360; tests with female sex attractant of, in Washington State, 368; sprays against, on apple in Lebanon, 381; tests with preparations containing *Bacillus thuringiensis* against larvae of, 430; tests of substitutes for DDT against, on apple in Queensland, 448; on apple in Poland, 453; pupating in soil in apple orchards in Soviet Union, 509; predicting occurrence of, on apple in Switzerland, 562; effects of tepa on reproduction of, 583; sex pheromone gland in, 646; development of, in apple in Holland, 653; use of light-traps for estimating populations of, 661

*Cydia prunivora*, infestation of, on insecticide treated apple in Wisconsin, 279

*Cydia strobilella*, glycerol content and cold-hardiness of, in Norway, 423

*Cydia toreuta*, attacking cones and seeds of *Pinus echinata* in North and South Carolina and in Tennessee, parasites of, 596

*Cydia youngana*, on *Picea glauca* in Alaska, 21

*Cydmaea binotata*, attacking *Hakea gibbosa* in New South Wales, 314

*Cydmaea eucalypti*, attacking *Hakea sericea* in New South Wales, 314

*Cydmaea major*, attacking *Hakea gibbosa* in New South Wales, 314

Cygon (see Dimethoate)

*Cylindrocarpus*, Collembola in relation to, on clover and grass in Holland, 383

*Cyllenia maculata*, parasitising *Periclista andrei* on oak in Portugal, 295

*Cynara*, investigations on virus attacking, 106

*Cynodon dactylon*, *Aleurocybotus occiduus* on, in U.S.A., 62; dimethoate residues on hybrid of, in Georgia, 273; insecticide residues in hybrid of, in Texas, 464; *Aceria neoecynodonis* and *Carneiocephala* spp., on, in Florida, 543

Cyolane (see 2-(Diethoxyphosphinothioylimino)-1,3-dithiolane)

*Cyperus alternifolius*, *Bactra truculenta* on, in Hawaii, 175

*Cyperus esculentus*, *Aleurocybotus occiduus* on, in U.S.A., 62; insects feeding on, in Hawaii, 175

*Cyperus papyrus*, *Bactra truculenta* and *Athesapeuta cyperi* on, in Hawaii, 175

*Cyperus polystachyos*, *Athesapeuta cyperi* on, in Hawaii, 175

*Cyperus rotundus*, *Aleurocybotus occiduus* on, in U.S.A., 62; *Bactra truculenta*, *Athesapeuta cyperi* and other insects feeding on, in Hawaii, 175

*Cyprinus carpio*, toxicity of  $\gamma$  BHC to, 494

Cyprus, *Anarsia lineatella* in, 333; *Euzophera osseatella* in, 611

*Cyrtomenus mirabilis*, control of, on groundnut in Brazil, 241

Cystine, in diet for *Tribolium* spp., 503

L-Cystine, attractive to *Eurytoma roddi*, 57

Cyta, predacious on other mites in Chile, 48

Cytovirin, effects of, on reproduction of *Myzus persicae*, 496

Czechoslovakia, pests of poplar in, *Stilpnolia salicis* on willow in, 8; *Scythropus mustela* on *Pinus sylvestris* in, 102; list of parasites and hosts reared in, 116; *Coccinella septempunctata* preying on *Aphis fabae* on beet in, 137;

parasites of aphids associated with *Prunus* trees in, bees pollinating lucerne in, 178; outbreak of *Pachynematus scutellatus* on spruce in, natural control of *Archips crataeganus* on oak in, 199; use of *Cheyletus eruditus* against stored-grain pests in, 200; transmission of pea mosaic virus by *Myzus persicae* in, 324; *Anarsia lineatella* in, 333; mites as vectors of insect diseases in, 345; *Colotois pennaria* in, 380; establishment of *Aphidius transcaspicus* against *Hyalopterus pruni* on plum in, 391; *Beauveria bassiana* for control of agricultural and forest pests in, 428; control of *Choristoneura murinana* on spruce in, 430; polyhedrosis of *Mamestra brassicae* in, 431; *Aradus cinnamomeus* in pine plantations in, 454; *Megoura viciae* parasitised by *Aphidius megourae* sp.n. in, 455; control of *Atomaria linearis* on sugar-beet in, control of *Aphis fabae* on sugar-beet in, 516; control of *Hyllobius abietis* on pine in, Lepidoptera associated with fir in, 517; Aphidiine parasites of aphids in, 603; book on Aphidiine Braconids of, 630; outbreaks of *Choristoneura murinana* on silver fir in, *Contarinia medicaginis* on lucerne in, cereals damaged by barley yellow-dwarf virus in, *Aceria carvi* damaging caraway in, 631; determination of critical number of *Neodiprion sertifer* on *Pinus mugo uncinata* in, *Adelges* spp., on *Abies alba* in, 632; *Myelophilus piniperda* damaging pine in, 656

## D

2,4-D (see 2,4-Dichlorophenoxyacetic Acid)

Dacthal (see Dimethyl Tetrachloroterephthalate)

*Dactylis glomerata*, *Thymelicus lineola* not found on, in Ontario, 350; *Melolontha melolontha* reared on leaves and stems of, in France, 460

*Dacus ciliatus*, Clensel as attractant for, 214

*Dacus cucurbitae*, Clensel as attractant for, movement of, in orchards in India, 214; reared at constant temperature in winter, population of, on guava in India, 218; bio-nomics and control of, on *Momordica charantia* in Philippines, 265;  $\gamma$ -radiation as quarantine treatment against, infesting fruits in Hawaii, 284; toxicity of insecticides to, in India, 316; distribution of, as potential pest in Florida, 543

*Dacus diversus*, Clensel as attractant for, movement of, in orchards in India, 214; population of, on guava in India, reared at constant temperature in winter, 218

*Dacus dorsalis*, on fruit trees in Rota, parasites of, other measures against, 37; differential effect of  $\gamma$ -radiation on, and its parasites, 170; Clensel as attractant for, population fluctuation and movement of, in orchards in India, 214; population of, on guava in India, reared at constant temperature in winter, 218;  $\gamma$ -radiation as quarantine treatment against, infesting fruits in Hawaii, 284; as potential pest in Florida, 543

- Dacus hageni*, population of, on guava in India, reared at constant temperature in winter, 218
- Dacus oleae*, diets for, experiments with chemosterilants for, 52; insecticides against, on olive in Italy, 92; dimethoate against, 94; natural enemies of, on olive in France, 107, 108; effects of  $\gamma$ -radiation on, in Greece, 284; control of, on olive in Italy, 390; effects of streptomycin on adults of, and on progeny on olives in Greece, 411; on imported olives in Florida, 543; sterilisation of adults of, on olive trees in Greece, 578; use of *Opius concolor sculus* against, on olive in Italy, 607; relation between *Macrophoma* spot on olive and, in Israel, 637; malathion sprays containing protein-hydrolysate attractant against, on olive in Israel, 638
- Dacus tryoni*, mass-rearing of, 44; radiation and ovarian maturation and fat-body histolysis in, 298; on *Citrus* in Australia, 543; control of, by  $\gamma$ -radiation, 585
- Dacus zonatus*, Censel as attractant for, population fluctuation and movement of, in orchards in India, 214
- Daedalea unicolor*, on hypopleural organs of female larva of *Tremex columba*, 402
- Dahlbominus fuliginosus*, parasitising *Neodiprion pratti pratti* in Virginia, 34; parasitising *Diprion pini* in Germany, 99; parasitising *Neodiprion sertifer* on pine in Czechoslovakia, 200
- Dahlia, *Gymnoscelis pumilata* on, in Sicily, 608
- Dakota, North, *Pachygonatopus minimus* as parasite of *Macrosteles fascifrons* in, 156; food habits of grasshoppers in sandhills prairie in, 571; *Stenodiplosis bromicola* on *Bromus* spp., in, 639
- Dakota, South, *Eleodes* spp. attacking wheat in, 270; *Lasius niger* affecting survival and dispersal of subterranean aphids in, subterranean aphids in relation to barley yellow-dwarf virus in, 292; *Diabrotica virgifera* on maize in, 368; holocyclic strain of *Therioaphis trifolii* on lucerne in, 493
- Dalbergia sissoo*, *Nipaecoccus vastator* on, in India, 86
- Dalbulus maidis*, transmission of maize-stunt virus by, in U.S.A., 70; virus disease of maize transmitted by, in Venezuela, 300; effects of plant virus on survival, food acceptability, and digestive enzymes of, 345; effects of environmental conditions on, on maize in Georgia, 500; transmission of maize stunt virus by, in U.S.A., 644
- Dalopius pallidus*, damaging potato in Quebec, 157
- Damson, *Ischnonyx prunorum* on, in Bulgaria, 327
- DAN (see 2,4-Dinitro- $\alpha$ -naphthol)
- Dandelion (see *Taraxacum officinale*)
- Danthonia spicata*, *Thymelicus lineola* not found on, in Ontario, 350
- Daphnia*, toxicity of insecticide to, 160
- Daphnia magna*, breeding of, for use in bioassay of insecticides, 178; for determination of insecticide residues, 473
- Dark, responses of *Trogoderma granarium* to, 601
- Dasyneura affinis*, control measures against, infesting violets in Britain, 650
- Dasyneura amaramanjarae*, bionomics of, infesting mango inflorescences in India, 477, 478
- Dasyneura brassicae*, parasites of, on rape in Sweden, 182
- Dasyneura canadensis*, on *Picea glauca* in Alaska, 21
- Dasyneura citri* sp.n., feeding on flower buds of *Citrus* in India, 478
- Dasyneura pyri*, resistance to insecticides in, on pear in Poland, 515
- Dasyneura rachiphaga*, on *Picea glauca* in Alaska, 21
- Dasyneura tetensi*, bionomics of, on black currant in Austria, Britain, Finland and Germany, insecticides and other measures against, 54
- Dasytus plumbeus*, preying on *Archips crataeganus* on oak in Czechoslovakia, 199
- Date, pests of, in Iran, 519
- Date Palm, *Parlatoria blanchardii* on, in Israel, 144
- Dates (Stored), insects infesting, in Israel, 143
- Datura stramonium*, cotton virus not transmitted to, transmission of tomato virus disease to, 505
- D-D mixture (1,2-dichloropropane and 1,3-dichloropropene), as soil fumigant, against larvae of *Limonia canus*, 366
- DD-136 (nematode), bionomics of, in Missouri, 541; infecting *Scutigerella immaculata*, 572
- DDA, as metabolite of DDT, 491
- DDD, toxicity of, to *Cydia pomonella*, 75; toxicity of, to fish, 80; toxicity of, to *Spodoptera littoralis*, 84; fate of, inhaled with tobacco smoke, labelled with  $C^{14}$ , 187; in sprays against *Cheimophila salicella*, 267; biological conversion of DDT to, 374; toxicity of, in sprays, to predacious insects, 471; residues of, in atmospheric environment, 618; residues of, in big game animals in United States, 641
- DDE, as metabolite of DDT, persistence of, in soil, 45; concentrations of, in human milk and body fat, 299; as metabolite of DDT, 488, 491; residues of, in big game animals in United States, 641
- DDT, bacterial suspensions not synergised by, 8; unsatisfactory against *Hoplocampa* spp., stimulating effect of, on Tetranychids, 9; and azinphos-methyl, and diazinon, against *Cydia pomonella*, question of effectiveness of, against *Bryobia praetiosa*, 10; against *Leptinotarsa decemlineata*, and *Beauveria bassiana*, 14, and parathion, residues of, on apple, 25; factors of resistance of *Euxesta notata* to, 27; resistance to, in *Miccotrogus picirostris*, toxicity of, to bees, 29; and oil, against *Aphrophora saratogensis*, effects of, on wildlife, 36; and toxaphene, susceptibility of bees to, 40; against *Lambdina fiscellaria lugubrosa*, 42; against *Hylemya trichodactyla*, 43; effect of electrostatic dusting of, on dust deposition, 44; against *Heliothis zea*, metabolism of, in soil, persistence of in soil, 45; against *Lepti-*



*notarsa decemlineata*, 52; against *Hyponomeuta padellus*, and dieldrin, toxicity of, to *Drosophila melanogaster*, and *Tribolium castaneum*, 54; against *Mycodiplosis alternata*, 69; against Carabids, toxicity of, to *Distantiella theobroma*, 72; against *Eriosoma lanigerum* and *Pheidole megacephala*, *Aphelinus mali* unharmed by, 73; against weevils, 74; toxicity of, to *Cydia pomonella*, persistence of, on apple, 75; susceptibility of *Dermestes* to, 78; toxicity of, to fish, 80; against *Macrosiphum pisum*, 82; toxicity of, to *Spodoptera littoralis*, 84; toxicity of, to termites, 86; against *Ostrinia nubilalis*, against *Tychius flavus*, soil and seed treatment with, against *Leptinotarsa decemlineata*, 91; against *Argyresthia trifasciata*, 95; against Thysanoptera, 102; dusts of, applied by air against *Thaumetopoea pityocampa*, effect of, on beneficial insects, 126; in dusts and sprays against *Rhyaciona buoliana*, and carbaryl, 127; in dusts against insect pests of cotton, 134; and diazinon, in sprays against *Ceratitis capitata* and Coccids, 135; residues of, in plants, 137; aerial application of, in dusts and sprays against *Archips crataeganus*, 142; in sprays against *Rhopalosiphum erysimi*, 146; aerial application of, against *Choristoneura fumiferana*, 152; destroying natural enemies of *Tetranychus cinnabarinus*, 164; and azinphos-methyl, and toxaphene, in sprays against cotton pests, 166; response to, in *Costelytra zealandica* in relation to sex and weight, resistance to, in *Costelytra zealandica*, 176; susceptibility of *Stenomolima muscarum* to, 182; mode of action of, 184; effect of, on vitamin A concentrations in cattle, 187; in dusts against *Bupalus piniarius*, effect of, on parasites of *Bupalus piniarius*, 189; in sprays and aerosols against *Argyresthia conjugella*, 191; against *Cleonus punctiventris*, in dusts against *Lobesia botrana*, 195; in sprays against *Typhlocyba rosae*, 197; and  $\gamma$  BHC, in dusts against *Chaetocnema* spp., in dusts against *Salebria semirubella sanguinella*, 198; effect of, in aerosols on *Neodiprion sertifer* and its parasites, aircraft application of, 200; against *Elasmopalpus lignosellus*, 206; and parathion, and malathion, in sprays against *Aerobasis caryae*, 209; and other insecticides, in sprays and dusts against cotton bollworms, 211; with other insecticides, against insects and mites, 213; and toxaphene, in dusts against *Amsacta moorei*, 214; toxicity of, to *Heterotermes indicola*, 216; toxicity of, to *Tribolium castaneum* and *Sitophilus oryzae*, in sprays against *Hymenia recurvulus*, 217; and BHC in dusts against *Leguminivora glycinivorella*, 220; in granules against *Ostrinia nubilalis* and *Proceras venosatus*, 221; against *Heteronychus arator*, and endrin, in sprays against *Spodoptera litura*, 222; in sprays against *Cnephasia virgaureana*, 226; in sprays against *Enarmonia formosana*, 229; in sprays against *Agriphila straminea*, 230; in sprays against *Plutella maculipennis*, phytotoxicity of, soil treatment with, against *Psila rosae* and *Hylemya brassicae*, 231; effect of, on successive generations of

*Callosobruchus chinensis* treated with, 235; effect on *Euxesta notata* of selection with, 236; in dusts against *Oxycarenus hyalinipennis*, 243; and BHC, trunk treatment with, in sprays against *Coraeus undatus*, 255; persistence of spray residues of, on *Solanum melongena*, persistence on *Hibiscus* of spray residues of, against *Earias fabia*, 260; in dusts against *Pseudaletia unipuncta*, 260; toxicity of, to *Sitophilus oryzae* and *Tribolium castaneum*, 261; and trichlorophon, against *Agrotis ipsilon* and *A. segetum*, 264; and soap, and nicotine preparation, in sprays against *Dacus cucurbitae*, and *Nola distributa*, 265; in sprays against *Cheimophila salicella*, residues on maize from, in sprays against *Ostrinia nubilalis*, 267; contact versus stomach toxicity of, to *Spodoptera littoralis*, 269; and parathion in sprays against cotton pests, in sprays against *Anthonomus grandis*, 272; applied to soil in sprays against *Conoderus* spp., 274; and malathion, in low-volume sprays against *Anthonomus grandis*, 275; swollen abdomens in *Cydia molesta* treated with, 276; in sprays against cotton pests, 278; and captan, in sprays against apple pests, 279; in sprays against *Spodoptera frugiperda*, 280; in sprays against *Psylla pyricola*, 282; presence of, in rainwater in England, 298; concentrations of, in human milk and body fat, 299; in granules or with superphosphate, residues of, in cows milk, residues of, in depot fat of sheep, 312; mechanism of resistance to, in *Musca domestica vicina*, 315; toxicity of, to adults and larvae of *Dacus cucurbitae*, 316; in dusts, against beetles injurious to lucerne, 323; in sprays, against *Tettigella viridis*, 326; against *Rhagoletis cerasi*, 328; against *Chrysomela americana*, toxic to beneficial insects, 331; and BHC in sprays against insect pests of apple, vines and *Prunus*, 337; comparison of susceptibility to, in populations of *Leptinotarsa decemlineata*, 340; in sprays, effects of, on reproduction of *Tetranychus telarius*, 353; with Strobane or toxaphene, in sprays against *Anthonomus grandis* and *Heliothis zea*, 355; and toxaphene, in sprays, against *Psallus seriatus*, 358; against *Heliothis zea*, *Spodoptera frugiperda*, 361; in sprays, emulsified solutions of, effects of adjuvants on deposition of, 366; resistance to, in *Heliothis zea*, in dusts, against *Heliothis zea*, *Trichoplusia ni* and *Macrosiphum ambrosiae*, 367; alone or with toxaphene, resistance to, in *Heliothis* spp., 369; labelled with  $^{14}\text{C}$ , biological conversion of, to DDD, 374; in diesel oil, applied from aircraft, against *Choristoneura murinana*, 379; in dusts against *Pissodes validirostris*, 388; aerial spraying with, in oil against pests of beans, 394; effects of soil types on, against *Trinervitermes trinervoides*, 395; in sprays against pests of tea, against *Helopeltis theivora*, 397; effectiveness of, in stored pine sapwood against termites, 408; action of, on nerve of *Periplaneta americana*, 418; effect of sprays of, on *Oligonychus ununguis* and *Contarinia* spp., 421; effects of, on plants

used in sprays against *Sitodiplosis mosellana*, soil treatments with, tolerance of larvae of *Nemocastes incomptus* to, and malathion, in sprays against *Trachyploeus bifoveolatus*, 422; in sprays against *Choristoneura murinana*, 430; mode of action of *Beauveria bassiana* and, against *Leptinotarsa decemlineata*, 432; effect of, and *Beauveria bassiana* on fecundity and diapause of *Leptinotarsa decemlineata*, 433; alone and with parathion, effective in sprays against *Aporia crataegi*, 439; in dusts against *Galerucella birmanica*, 440; effect of, on properties of cotton, 441; alone and with BHC, toxaphene, endosulfan and trichlorophen, effect of, against cotton pests, on crop yields, 442; resistance to, in *Cydia pomonella*, 448; alone and with WARF Antiresistant, resistance to, in *Phthorimaea operculella*, in sprays against *Petrobia latens*, 449; effectiveness of, against *Cydia funebrana*, 452; effect of, on numbers of *Panonychus ulmi*, and *Eulecanium corni*, 453; against *Rhynchaenus fagi*, 456; in sprays against *Scaphioideus littoralis*, 458, 459; factors affecting efficiency of, in soil or seed treatments against crop pests, 461; secretion of, in cows, 464; effect of, on *Oscinella frit*, 467; toxicity of, in sprays, to predaceous insects, in sprays against *Typhlodromus pyri*, 471; alone or with BHC, toxaphene, dieldrin, endrin and fenthion, effects of, on maize borers, in sprays and granules against maize borers, 472; alone or with BHC, effect of, in sprays against cotton worms, on populations of spider mites, 474; in sprays against *Acrocercops cramerella*, 481; in sprays against *Athalia rosae ruficornis*, 483; in baits and sprays, against *Oncopera* spp., effect of, on *Tetranychus telarius*, 484; in sprays against *Heliothis zea*, 486; metabolism and excretion of, in *Ceratomegilla maculata*, 488; labelled with  $^{14}\text{C}$ , penetration and metabolism of, in resistant and susceptible strains of *Heliothis virescens*, 491; *Hylemya brassicae* not resistant to, 493; in sprays against *Lygus lineolaris*, 496; in dusts against *Lethrus jacobsoni*, 511; effectiveness of, against stored-product beetles, 513; in sprays against *Rhagoletis cerasi*, 514; preplanting treatment with, against *Hylobius abietis*, 517; size and weight of larvae of *Pristiphora erichsonii* affecting toxicity of, 522; low-volume aerial sprays of, against *Heliothis armigera* and *Acanthomia horrida*, 530; in oil emulsion, in sprays against *Pegomya betae*, and in dusts against *Aphis fabae*, 551; soil treatment with, against *Hylemya* spp., and effect of, on cabbage; in dusts against *Apion* and *Sitona*, 552; in sprays against *Argyresthia ephippella*, 553; alone and with methyl-parathion in sprays and dusts, against *Eurygaster integriceps*, 554; and *Beauveria* spp., in sprays against *Leptinotarsa decemlineata*; in dusts and in sprays, against *Phyllotreta cruciferae*, 555; in sprays against *Cladius pectinicornis*, against *Collicularia microgrammana*, 556; in dusts against *Choristoneura murinana*, 563; in dusts against woodlice, 564; applied

in sprays, sexually controlled differences in susceptibility of *Otiorynchus niger* to, 565; and BHC, contamination of packaged food-stuffs from, in aerosols, 582; against *Lasioderma serricorne*, 583; persistence of, in soil bioassay of, using *Coptotermes formosanus*, 587; alone and with oil emulsions and WARF Antiresistant, in sprays against *Thrips tabaci*, 590; in dusts and sprays, against *Lema* spp., and other Cricerids, 606; and parathion, in sprays against *Gymnoscelis pumilata*, 608; in dusts against *Lytta vesicatoria* and *Omophlus lepturoides*, 611; tests of, against *Phthorimaea operculella*, 613; for protection of freshly felled timber in storage against insect borers and subterranean termites, 615; residues of, in atmospheric environment, 618; persistence of deposits of, used in sprays against stored-product beetles, 622; and BHC, in dusts against *Dysdercus* spp., 624; evaluation of hand-operated spraying machines for, against cotton pests, 625; alone and with parathion in dusts or sprays against *Trioza tremblayi*, 627; with BHC and sodium fluosilicate, in dusts against *Phyllotreta vitula*, 633; persistence of behavioural resistance to, in *Drosophila melanogaster*, 634; residues of, in big game animals in United States, 641; alone and with WARF Antiresistant, resistance to, in *Rhagoletis pomonella*, 642; in sprays against *Caloptilia syringella*, 649; in sprays, contaminating cows milk, 654; effect of, on blood cells of *Periplaneta americana* and *Poecilotherus pictus* treated topically and *Samia cynthia ricini* treated by injection, 662

DDVP (see Dichlorvos)

2,3,3a,4,5,6,7,7a,8,8-Decachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene-1-one, (see Chlordecone)

Decachlorobi-2,4-cyclopentadien-1-yl, against *Panonychus ulmi*, 26

Decachlorooctahydro-1,3,4-metheno-2H-cyclobuta-(cd)pentalen-2-one, (see Chlordecone)

Decachloropentacyclo [3,3,2,0<sup>2,6</sup>,0<sup>3,9</sup>,0<sup>7,10</sup>]-decan-4-one, (see Chlordecone)

Dedelin (a mixture of DDT and  $\gamma$  BHC), in sprays against *Cladius pectinicornis*, 556

Deer, DDT residues in, in United States, 641

Delaware, flight records of Hemiptera in, 42; aphids on vegetables in, 363; *Spilochalcis delumbis* and *Paralipse infernalis* parasitic in *Lema* sp., in, 368; hyperparasites of *Bathyplectes curculionis* parasitising larvae of *Hypera variabilis* on lucerne in, 369; *Macrosiphum pisum* parasitised by *Aphidius smithi* in, 501

Delnav (see Dioxathion)

Delphinidin, relation of *Pissodes strobi* to, in extracts of *Pinus strobus*, 452

*Deltiocephalus glaucus*, parasites of, on grape vines and weeds in Chile, 378

Demeton, against *Oberea oculata*, 6; against *Panonychus ulmi*, 26; against *Chaitophorus populellus*, 27; against cone-infesting insects, toxicity of, to Douglas fir, 44; residues of, in plants, 137; injection of, into soil at base of



- seedlings against *Cinara*, 152; as drench against *Macrosiphum solani*, 160; ineffectiveness of, in sprays against *Tetranychus telarius*, 164; in sprays against *Typhlocyba rosae*, 197; residues of, on apples, 238; strain of *Panonychus citri* resistant to, 282; in sprays, resistance to, in *Tetranychus telarius*, 319; in sprays, effect of sublethal doses of, on survival and fecundity of *Tetranychus telarius*, in sprays, against *Pseudococcus comstocki*, 320; applied to plants, or as deposits, against *Otiorynchus* spp., 326; in drenches against *Tetranychus mairianae*, effects of, on plants, 415; residues of, in plants, used against *Tetranychus telarius*, 461; in sprays against *Dasyneura affinis*, 650; in sprays against *Tetranychus telarius*, 652
- Demeton-methyl, non-stable resistance to, in *Myzus persicae*, 291
- Dendrocopos pubescens*, as predator of *Zeodietra grandiosella* and *Ostrinia nubilalis*, 302
- Dendroctonus*, *Macrocheles boudreauxi* sp.n., associated with, in U.S.A., 571
- Dendroctonus adjunctus*, nematodes associated with, on pine in New Mexico, 537
- Dendroctonus brevicornis*, correction to paper on estimating numbers of, on *Pinus ponderosa*, 155; attractiveness of lightning-struck ponderosa pine trees to, in Montana, 541
- Dendroctonus frontalis*, BHC in summer sprays against, on pine in Louisiana, 370; preyed on by *Thanasimus dubius* in North Carolina, 542; *Thanasimus dubius* predacious on, in Texas, 589
- Dendroctonus micans*, spread of, on roots of spruce in Soviet Union, 549
- Dendroctonus monticolae*, as synonym of *D. ponderosae*, 155
- Dendroctonus obsesus*, on spruce in Colorado, 67
- Dendroctonus ponderosae*, *D. monticolae* as synonym of, distribution of attacks by, on *Pinus contorta latifolia* in British Columbia, 155
- Dendroctonus pseudotsugae*, Diptera associated with, on Douglas fir in Washington and Oregon, 310; effectiveness of frass of, in rearing medium for *Medetera aldrichii*, 412; parasitised by *Coeloides brunneri*, 605
- Dendrolimus pini*, parasitised by *Trichogramma cacoeciae pini* in Soviet Union, 190; parasitism, occurrence and control of, on pine in Austria, 562
- Dendrolimus punctatus*, hybridization between other species of *Dendrolimus* and, in China, 220
- Dendrolimus spectabilis*, parasitised by *Carcelia bombylans* in Japan, 115; hybridization between other species of *Dendrolimus* and, in China, 220; bionomics, distribution population dynamics, parasites, chemosterilisation and control of, on pine in Korea; larvae and pupae of, as food for fowls, 635
- Dendrolimus tabulaeformis*, hybridization between other species of *Dendrolimus* and, in China, 220
- Denmark, parasites of aphids and *Rhynchaenus fagi* in, 239; *Epichorista ionephela* on carnation in, 345; *Hylotrupes bajulus* in pine wood in, 402; *Hylobius abietis* on conifers in, 563
- Deraeocoris pallens*, attacking *Hypera variabilis* in Iran, 570
- Deretrichia szentivani* sp.n., on *Theobroma cacao* in New Britain and Feni Islands, 463
- Dermatophagoides*, differentiation of species of, 208
- Dermatophagoides culinae* sp.n., preventing rising of self-rising flour, 208
- Dermestes ater*, toxicity of insecticides to, 78
- Dermestes lardarius*, toxicity of insecticides to, 78; insecticides against, 253
- Dermestes maculatus*, toxicity of insecticides to, 77; insecticides against, infesting dried fish in Kenya, 82; insecticides against, 253
- Derostenus variipes*, insecticides against *Liriomyza munda* not destroying, in Florida, 208
- Derris, against *Macrosiphum pisum*, 82
- Derris Powder, and soap in sprays against *Dacus cucurbitae*, 265
- Desmethyl Bromophos (see O-Methyl O-4-Bromo-2,5-dichlorophenyl Phosphorothioate)
- Desmodium canadense*, *Atomacera debilis* on, in Ontario, 155
- Desmodium glutinosum*, *Atomacera debilis* on, in Ontario, 155
- Detox 25, as spray against *Leptinotarsa decemlineata*, 92 (see also DDT)
- Deuterosminthurus repandus*, injuring lucerne in Tunisia, 393
- Devorgilla*, *Rupela albinella* parasitised by, in British Guiana, 171; parasitising *Orthaga* sp., on *Syzygium fruticosum* in India, parasitised by *Perilampus microgastris* in India, 662
- Devorgilla canescens*, as vector of *Bacillus*, larval parasite of *Ephestia kuehniella*, 49
- Dextrose, in diets for insects, 34
- DFP (see Diisopropyl Phosphorofluoridate)
- Diabrotica*, flotation technique for extracting eggs of, from soil, 296
- Diabrotica balteata*, effects of chemosterilants on fertility of, 279; on cultivated plants in U.S.A., 543
- Diabrotica longicornis*, toxicity of O,O-diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate to, 160; varietal resistance of maize to, in Indiana, 163; resistance to chlorinated hydrocarbons in, on maize in Wisconsin, 486; susceptibility or resistance to aldrin and heptachlor in, 491; on cultivated plants in U.S.A., 543
- Diabrotica undecimpunctata howardi*, granular systemic insecticides applied to spinach against, in Texas, 414; on cultivated plants in U.S.A., 543
- Diabrotica undecimpunctata undecimpunctata*, Bidrin against, 28; mass rearing of, 285; on cultivated plants in U.S.A., 543
- Diabrotica virgifera*, method of recovering eggs of, from soil, 494; on cultivated plants in U.S.A., 543
- Diacrisia obliqua*, attacking groundnut in India, 216
- Diadromus*, effect of host on fecundity of, parasitising *Acrolepia assectella* on leek, 182

- Diaeretiella rapae*, parasitic in *Brevicoryne brassicae* in Chile, parasitised by *Charips grioti* in Chile, 377
- Dialeurodes citri*, *D. kirkaldyi* differentiated from, 209
- Dialeurodes kirkaldyi*, differentiation of, from *D. citri*, records of, in Florida, 209
- Diaphania nitidalis*, varietal susceptibility of squash to, in N. Carolina, 31
- Diaprepes abbreviatus*, on *Citrus* in Florida, 210; on *Citrus* in Florida, 543
- Diatomaceous Earth, in dusts against *Choristoneura fumiferana*, 498
- Diatomite, as carrier for pyrethrin dusts, 394; as carrier for  $\gamma$  BHC dust, 442
- Diatraea saccharalis*, method of rearing, 65; resistance to insecticides in, on sugar-cane in Louisiana, rearing of, 165; damage to sugar-cane by, in Colombia, food-plants and parasites of, attacking rice in British Guiana, 171; granulated insecticides against, on sugar-cane in Uruguay, 212; diets for rearing of, in Puerto Rico, 268; factors affecting mating and egg-laying activity of, 411; in Americas, 481; winter survival of, in maize stalks in Louisiana, 581
- Diatraeophaga striatalis*, rearing and release of, against *Proceras sacchariphagus* in Réunion and Madagascar, 557
- Diataraxia oleracea*, combined use of parasites and micro-organisms in control of, on cabbage in Soviet Union, 432
- Diazinon, susceptibility of *Sitophilus* spp., to, 4; and DDT, against *Bryobia praetiosa* and *Cydia pomonella*, 10; residues of, in stored wheat, 41; against *Hylemya trichodactyla*, 43; toxicity of, to *Cydia pomonella*, 75; against *Hylemya brassicae*, 36; against *Psila rosae* and *Hylemya brassicae*, 80; toxicity of, to *Spodoptera littoralis*, 84; against *Argyresthia trifasciata*, 95; and DDT, in sprays against *Ceratitis capitata* and Coccids, in sprays against *Icerya purchasi*, *Phthorimaea operculella*, *Zeuzera pyrina* and *Cydia pomonella*, 135; in sprays against *Myzus persicae* and *Aphis gossypii*, 146; toxicity of, to cyclodiene-susceptible and cyclodiene-resistant strains of *Hylemya antiqua*, 163; in sprays against *Myzus persicae*, 167; effectiveness of, against *Costelytra zealandica* 176; against *Liriomyza munda*, surface-active agents added to sprays of, 208; toxicity of, to *Heterotermes indicola*, 216; toxicity of, to *Tribolium castaneum* and *Sitophilus oryzae*, 217; in sprays against *Zeuzera pyrina*, 228; against *Tribolium* spp., 254; against *Phyllocoptura oleivora*, 257; toxicity of, to *Sitophilus oryzae*, and *Tribolium castaneum*, 261; in sprays against *Paratiroza cockerelli* and *Myzus persicae*, 268; in sprays and granules against *Pediasia* spp., 269; topical and soil applications of, against *Eleodes suturalis*, 270; applied to soil in sprays and granules against *Conoderus* spp., 274; resistance to, in *Musca domestica vicina*, 315; toxicity of, to adults of *Dacus cucurbitae*, 316; toxicity of, to *Aonidiella aurantii*, 317; toxicity of, to *Oligonychus indicus*, 318; against *Hylemya antiqua*, 356; in granules and soil treatment with, ineffective against *Conoderus* sp., and *Lachnosterna cribrosa*, 364; in granules, against *Limoniulus canus*, 366; effect of sprays of, against *Frankliniella fusca* on yield of groundnuts, 376; against resistant strains of *Hylemya brassicae*, 420; in granules against resistant strains of *Hylemya brassicae*, in granules against resistant *Psila rosae*, toxicity of, to emergent seedlings, 421; soil treatment with, tolerance of larvae of *Sciopithes obscurus* to, 422; in sprays against *Echinocnemus oryzae*, 441; in sprays against *Petrobia latens*, 499; persistence of, in soil treated for control of *Costelytra zealandica*, 450; effectiveness of, against *Cydia funebrana*, 452; against *Psila rosae*, 469; against *Chilo auricilius*, 479; in sprays and granules against *Oxycanus* spp., 484; labelled with  $^{14}\text{C}$ , persistence of, in soils, effect of temperature on, against *Cotinis nitida*, 485; alone and with emulsions, in sprays against *Stomacoccus platani*, against *Diabrotica longicornis*, 486; aerial application of, against *Hypera variabilis*, *Hylemya brassicae* not resistant to, 493; residues of, on lettuce under glass, 518; as wettable powders against *Hypera variabilis*, 570; in sprays against *Chlamisus cribripennis*, 581; and carbamates against *Drosophila melanogaster*, 599; tests of, against *Phthorimaea operculella*, 613; persistence of deposits of, used in sprays against stored-product beetles, 622; in dusts against *Phyrdenus muriceus*, 639; in sprays against *Neodiprion taedae linearis*, 643; development of resistance to, in *Psylla pyricola*, 643; in sprays against *Aleurolobus barodensis*, 664
- Diazoxon (see Diethyl 2-Isopropyl-4-methyl-6-pyrimidinyl Phosphate)
- Dibrachys cavus*, parasitising *Itopectis conquisitor* in Virginia, 29
- Dicaphon, susceptibility of *Dermestes* to, 78; in sprays against *Myzus persicae*, 166; against *Dermestes maculatus* antagonised by triphenyl phosphate, 253; against *Tribolium* spp., 254
- Dichaetoneura leucoptera*, parasitising *Archips cerasivoranus* in Minnesota, 642
- Dichlofenthion, chemical definition of, 2; ineffective against *Hylemya brassicae*, 36; toxicity of, to cyclodiene-susceptible and cyclodiene-resistant strains of *Hylemya antiqua*, 163; against *Hylemya antiqua*, 356; against resistant strains of *Hylemya brassicae*, 420; in granules against resistant strains of *Hylemya brassicae*, 421
- Dichlone (see 2,3-Dichloro-1,4-naphthoquinone)
- 2,4-Dichlorobenzalaniline, toxicity of, to larvae of *Hylotrupes bajulus*, 405
- p-Dichlorobenzene impregnated in cotton against *Paranthrene tabaniformis*, 127
- Dichlorobromophenol, in stored wheat grains, 600
- 2,3-Dichloro-1,4-naphthoquinone, not affecting *Panonychus ulmi*, 157
- 2,4-Dichlorophenoxyacetic Acid, effect of, on larval growth in *Chilo suppressalis*, 147;



- (mixed amine salts of) effect of, on populations of aphids and Coccinellids in oat fields treated with, 424
- 2,4-Dichlorophenyl Diethyl Phosphorothionate, (see Dichlofenthion)
- N'-(3,4-Dichlorophenyl)-N,N-dimethylurea, and insecticides, effect of, on cotton seedlings, 596
- N-(3,4-Dichlorophenyl)-N'-2-(2-sulpho-4-chlorophenoxy)-5-chlorophenyl-urea, *Acheta domesticus* damaging fabric treated with sodium salt of, sodium salt of, protecting woollen fabric against *Tineola bisselliella*, 125
- 1,2 Dichloropropane, in D-D mixture, 366
- 1,3-Dichloropropene, in D-D mixture, 366
- Dichloropropenes, as soil fumigant, against *Limoniopsis canus*, 366
- Dichlorvos, use of, in traps for *Ceratitis capitata*, 53; toxicity of, to *Coccinella septempunctata*, 85; against *Liriomyza munda*, not harmful to parasites of *Liriomyza munda*, 208; in sprays against cotton pests, 215; for protection of stored grain, against *Oryzaephilus surinamensis*, 255; contact versus stomach toxicity of, to *Spodoptera littoralis*, 269; analogues of, and toxicity of, to agricultural insects, 283; analogues of, mouse toxicity and anticholinesterase activity of, to *Ceratitis capitata*, 292; stomach toxicity of, to hoppers of *Schistocerca gregaria*, 317; in aerosols, automatic dispensation of, against *Lasioderma serricorne*, 354; in aerosols, against *Ephestia elutella*, 355; residue analysis and screening of, by gel diffusion, 465; toxicity of, to *Spodoptera littoralis*, 472; slow release vapour of from PVC strips against *Ephestia kuehniella*, 505; metabolism of, in strains of *Nephotettix cincticeps*; against *Halyomorpha picus*, 546; against *Lasioderma serricorne*, 583; alone and with N-(2-methyl-4-chlorophenyl)-N',N'-dimethyl-formamidine, toxicity of vapours of, to *Tetranychus cinnabarinus*, 585; and Isolan, against *Drosophila melanogaster*, 599; against *Ceratitis capitata*, 613
- Dichrocrocis punctiferalis*, attacking *Anomum subulatum* in India, 440
- Dichroplus elongatus*, parasitised by *Tephromyiella neuquenensis* in Argentina and Chile, 409
- Dichroplus maculipennis*, parasitised by *Tephromyiella neuquenensis* in Argentina and Chile, 409
- Di cladispa gestroi*, distribution maps of, 401
- Dicofol, against *Panonychus ulmi*, 26; effect of, on beneficial mites and insects, 122; in sprays against mites and aphids not affecting parasitism by *Prospaltella perniciosi*, 123; toxicity of, to *Phytoseiulus persimilis* and *Tetranychus telarius*, 154; in sprays against *Tetranychus telarius*, 163; toxicity of, to *Tetranychus cinnabarinus*, 164; resistance and susceptibility to, in *Tetranychus telarius*, 181; in sprays against *Tetranychus telarius*, 230, 232; elimination of *Tetranychus telarius* by, in sprays against *Panonychus ulmi*, 267; against *Panonychus citri*, 269; acquisition of resistance to, by *Tetranychus telarius*, 293; toxicity of, to *Oligonychus indicus*, persistence of, on plants, 318; against *Tetranychus telarius*, 319; in sprays, against *Aculus pelekassi*, 331; against *Tetranychus telarius*, 350; and carbaryl, effects of, on pests of peach, 352; effects of sublethal doses of, on reproduction of *Tetranychus telarius*, 353; in sprays against *Panonychus ulmi*, 381; in sprays against *Oligonychus coffeae* and *Calacarus carinatus*, mist-blowing of, against *Calacarus carinatus*, 398; and DDT or carbaryl, in control of *Cydia pomonella*, 448; in sprays against *Petrobia latens*, 449; alone or with captan and cottonseed oil, in tests on avoidance of russetting of apples by, 472; and tetradifon, in sprays against mites on vines, 509; resistance to, in *Tetranychus telarius*, 515; in sprays against *Bryobia rubrioculus*, 640; against *Panonychus ulmi*, 652
- Dicranoctetes saccharella*, parasites of, in sugar-cane in Peru, 194
- Dicranura vinula*, parasitised by *Telenomus harpyae* in Portugal, 295
- Dicumarol, attractiveness of, to *Eurytoma roddi*, 57
- Didymotopis cercius* reared from *Liriomyza* sp., in Chile, 377
- Didymuria violescens*, causes of outbreaks of, on *Eucalyptus* in Australia, 396
- Dieldrex (see Dieldrin)
- Dieldrin, against *Leptinotarsa decemlineata*, 15; labelled with  $^{14}\text{C}$ , uptake of, by wheat plants, 19; factors of resistance of *Euxesta notata* to, 27; against *Graphognathus leucoloma fecundus*, persistence of, in soil, 32; against *Hylemya brassicae*, 36; against *Sitona cylindricollis*, 40; persistence of, in soil, 45; against *Schistocerca gregaria*, 51; with BHC and DDT, toxicity of, to *Tribolium castaneum* and *Drosophila melanogaster*, 54; resistance of *Distantiella theobroma* to, 72; susceptibility of *Dermestes* to, 78; against *Hylemya brassicae* and *Psila rosae*, 80; toxicity of, to fish; toxicity of, to *Spodoptera littoralis*, 84; soil and seed treatment with, 91; *Acheta domesticus* damaging fabric treated with, protecting woollen fabric against *Tineola bisselliella*, 125; alone or with other insecticides, in sprays against *Zeuzera pyrina*, *Cydia pomonella*, *Ceratitis capitata* and *Phthorinaea operculella*, trunk and soil treatments with, in sprays against wood-borers, 135; residues of, in plants, seed treatment with, against *Psila rosae*, 137; decline in residues of, applied in sprays to lucerne 156; in baits against *Melanoplus* sp., 161; toxicity of, to cyclodiene-susceptible and cyclodiene-resistant strains of *Hylemya antiqua*, 163; against *Conotrachelus nenuphar*, 165; in sprays against rice pests, seed treatment with, and in sprays against *Helodrytes foveolatus*, 171; mothproofing of wool with, 185; bioassay of residues of, in wheat, 202; against *Elasmopalpus lignosellus*, 206; toxicity of, to *Heterotermes indicola*, 216; toxicity of, to *Tribolium castaneum* and *Sitophilus oryzae*, 217; persistence of, against *Schistocerca gregaria*, 219; in sprays against *Heteronychus arator*, 222; effect on *Euxesta*

*notata* of selection with, 236; stem treatment with, against *Bixadus sierricola*, 245; ineffective in dusts against *Coraebus undatus*, 255; toxicity of, to *Amsacta moorei*, 259; persistence on *Hibiscus* of spray residues of, against *Earias fabia*, 260; toxicity of, to *Stiphilus oryzae* and *Tribolium castaneum*, 261; applied to seed furrow against *Atherigona indica*, 262; in sprays against *Pediasia* spp., contact versus stomach toxicity of, to *Spodoptera littoralis*, 269; topical and soil applications of, against *Eleodes suturalis*, 270; presence and persistence of residues of, on forage crops, 276; in sprays against apple pests, 279; residues of, in crop seeds, soil treatment with, against *Popillia japonica*, 281; in seed-dressings against *Hylemya coarctata*, 294; presence of, in rainwater in England, 298; in sprays, against *Lema melanopa*, 302; mechanism of resistance to, in *Musca domestica vicina*, 315; toxicity of, to adults and larvae of *Dacus cucurbitae*, 316; stomach toxicity of, to hoppers of *Schistocerca gregaria*, 317; in dusts, against *Otiorynchus* spp., 326; against termites, in dusts, and soil treatment with, against *Tipulid* larvae, 329; inheritance of resistance to, in *Hylemya brassicae*, 352; in sprays and granules, against *Hypera variabilis*, 362; in granules and soil treatment with, against *Conoderus* sp., and *Lachnosterna cribrata*, 364; soil treatment with, against *Otiorynchus ligustici*, residues of, on forage crops, 368; in sprays against *Thomasiniana theobaldi*, soil treatments with, not effective against *Thomasiniana theobaldi*, 382; effects of soil types on, against *Trinervitermes trinovoides*, 395; side-effects of spraying with, against pests of tea, 397; residues of, in birds, 400; effectiveness of, in stored pine sapwood against termites, 408; in sprays, granules and soil treatment with, tolerance of larvae of *Nemocestes incomptus* and *Sciopithes obscurus* to, 422; in sprays against *Echinocnemus oryzae*, and coumarone resin, factors affecting efficiency of, in sprays against *Xyleborus fornicatus*, 441; effect of, against cotton pests, on crop yields, 442; soil and seed treatments with; in dusts against termites, 445; in sprays against *Xyleborus fornicatus*; harmful to *Macrocentrus homonae* parasitising *Homona coffearia*, 446; factors affecting efficiency of, in soil or seed treatments against crop pests, 461; drug treatment reducing storage of, in rats, 464; in sprays and drenches against *Psila rosae* and *Euleia heraclei*, 469; in sprays against maize borers, 472; against termites and *Chilo infuscatellus*, 479; in sprays against *Amblypelta lutescens papuensis*, 480; resistance to, in *Hylemya brassicae*, 493; repopulation of thrips in areas previously treated with, against *Popillia japonica*; against *Hypera variabilis*, 497; dusting and spraying surface of soil with, against *Contarinia medicaginis*, 512; against *Chilo polychrysa*, 527; in sprays, against *Hypera variabilis*, 570; persistence of, against *Lichnanthe vulpina* and *Lachnosterna anxia*

in cranberry bogs, 586; in soil for control of subterranean termites, bioassay of, using *Coptotermes formosanus*, 587; toxicity of concentrated sprays of, to locusts and grasshoppers, 593; susceptibility of *Limonioides dubitans* to, 594; in sprays against pests of cowpea, 605; in sprays, against *Lema* spp., and other Cricerids, 606; and Bordeaux mixture, in sprays against *Xylosandrus compactus*, for protection of freshly felled timber in storage against insect borers and subterranean termites, 615; residues of, in atmospheric environment, 618; persistence of deposits of, used in sprays against stored-product beetles, 622; tests for resistance to, in *Sahlbergella singularis* and *Distantiella theobroma*, 626; in dusts against *Trioza tremblayi*, 627; in granules against *Lema melanopa*, 642; development of resistance to, in *Psylla pyricola*, 643; seed treatment with, against *Podagrica* spp., 656; effect of, on blood cells of *Periplaneta americana* and *Poecilocus pictus* treated topically and *Samia cynthia ricina* treated by injection, 662

Dieldrin, containing dieldrin, 125

Diethion (see Ethion)

2-(Diethoxyphosphinothioylimino)-1,3-dithiolane, synergism of, against *Anthonomus grandis*, 169; in sprays against *Spodoptera litura*, 223; in sprays against *Alabama argillacea*, 243; in granules against *Phyllostreta pusilla*, *Trichoplusia ni*, *Brevicoryne brassicae* and *Diabrotica undecimpunctata howardi*, effects of, on plants, 414; in granules against *Tetranychus marianae*, effects of on plants, 415; in granules against resistant *Psilarosae*; toxicity of, to emergent seedlings, 421; guide to, 545

2-(Diethoxyphosphinylimino)-1,3-dithiolane, against *Contarinia* and *Megastigmus spermotrophus*, systemic treatment of Douglas fir with, and toxicity of, to Douglas fir, 44; in sprays against *Lygus hesperus* and *Frankliniella occidentalis*, 276; and feeding stimulant on cotton, soil treatment with, in granules against *Anthonomus grandis*, against cotton pests, 278; as side-dressings, against *Myzus persicae*, 355; in sprays against *Agrotis orthogonia*, 590

2-(Diethoxyphosphinylimino)-4-methyl-1,3-dithiolane, against cotton pests, 278; as side-dressing, against *Myzus persicae*, 355; against *Hypera variabilis*, 497; in sprays against *Agrotis orthogonia*, 590

O,O-Diethyl O-(4-Bromo-2,5-dichlorophenyl) Phosphorothioate, (see Bromophos-ethyl)

O,O-Diethyl S-2-Carbamoyloxy-ethyl Phosphorodithioate, toxicity of, to phosphorus-resistant and susceptible mites, 282

O,O-Diethyl O-2-Chloro-1-(2,5-dichlorophenyl) vinyl Phosphorothioate, against *Lasioderma sericorne*, 583

O,O-Diethyl S-(6-Chloro-2-oxobenzoxazolin-3-yl)-methyl Phosphorodithioate (see Phosalone)

O,O-Diethyl S-N-(1-Cyano-1-methylethyl) carbamoylmethyl Phosphorothioate (see Cyanthoate)



- Diethyl 1-(2,4-Dichlorophenyl)-2-chlorovinyl Phosphate (see Chlorfenvinphos)
- O,O-Diethyl O-(2,4-Dichlorophenyl) Phosphorothioate (see Dichlofenthion)
- O,O-Diethyl S-1,2-Di(ethoxycarbonyl) ethyl Phosphorodithioate, against *Dermestes* spp., triphenyl phosphate not affecting toxicity of, to *Dermestes maculatus*, 253
- O,O-Diethyl S-(2,3-Dihydro-5-isopropoxy-2-oxo-1,3,4-thiadiazol-3-ylmethyl) Phosphorodithioate (see Prothidathion)
- Diethyl S-(2,3-Dihydro-5-isopropoxy-2-oxo-1,3,4-thiadiazol-3-ylmethyl) Phosphorothioate (see Prothidathion)
- O,O-Diethyl S-(Ethylthiomethyl) Phosphorodithioate (see Phorate)
- Diethyl 2-Isopropyl-4-methyl-6-pyrimidinyl Phosphate, inhibition of cholinesterase by, 117; resistance to, in *Musca domestica vicina*, 315; and carbamates, against *Drosophila melanogaster*, 599
- Diethyl Malathion (see O,O-Diethyl S-1,2-Di(ethoxycarbonyl) ethyl Phosphorodithioate)
- O,O-Diethyl S-2-(1-Methylcarbamoyl ethylthio) ethyl Phosphorodithioate, effect of seed treatments with, on cotton and cotton insects, 272
- O,O-Diethyl S-2-(Methylcarbamoyl-methylthio)ethyl Phosphorodithioate, effect on cottonseed of soil treatment with, 242; effect of seed treatments with, on cotton and cotton insects, 272
- O,O-Diethyl O-p-(Methylsulphinyl) Phenylphosphonothioate, soil treatments with, against *Costelytra zealandica*, 450
- O,O-Diethyl O-4-Methylsulphinylphenyl Phosphorothioate (see Fensulfothion)
- O,O-Diethyl O-2-Thiomethyl-4-methyl-6-pyrimidinyl Phosphorothioate, and carbamates, against *Drosophila melanogaster*, 599
- O,O-Diethyl O-3,5,6-Trichloro-2-pyridyl Phosphorothioate, effectiveness of, against insects and other arthropods, effects of, on snails and aquatic fauna, 160; toxicity of, to *Hylemya brassicae*, 493; guide to, 545
- 2-Diethylaminoethyl 2,2-Diphenyl-n-pentanoate, in tests for synergism with pyrethrins, 114
- 2-Diethylaminoethyl Piperonylate, synergistic activity of, 114
- Diethylstilboestrol, attractive to *Eurytoma roddi*, 57
- Digama hearseyana*, bionomics of, on *Carissa carandas* in India, 638
- Digitaria decumbens*, pests and diseases of, in British Guiana, 638
- Diglyphus*, reared from *Liriomyza* sp. in Chile, 377
- Dihydrocholesterol, utilization of, by *Melanoplus bivittatus*, 43
- 2,3-Dihydro-2,2-dimethyl-7-benzofuranyl Methylcarbamate, against *Hypera variabilis*, 36; seed treatments with, against *Lissorhoptrus oryzophilus*, 161; in drenches and granules, and seed treatment with, against *Hylemya antiqua*, 356; toxicity of, to *Hylemya brassicae*, 493; seed treatment with, in granules against cotton pests, 589
- S-(2,3-Dihydro-5-methoxy-2-oxo-1,3,4-thiadiazol-3-ylmethyl) Dimethyl Phosphorothioate (see Methidathion)
- N,N'-diisopropylphosphorodiamidothionic Fluoride (see Thiono-mipafox)
- N,N'-Diisopropylphosphorodiamidic Fluoride (see Mipafox)
- Diisopropyl Phosphorofluoridate, toxicity of, to insects and mice, 188
- Dilan (mixture of Bulan and Prolan), toxicity of, to *Spodoptera littoralis*, 84; in sprays against *Psylla pyricola*, 282, 643
- Dill (see *Peucedanum graveolens*)
- Diloponis inconspicuus*, bionomics of, predacious on *Aonidiella aurantii* on *Citrus* in South Africa, 129
- Dimecron (see Phosphamidon)
- Dimefox, toxicity of, to insects and mice, 188
- Dimethoate, against larvae of *Zeuzera pyrina*, against *Cydia pomonella*, 5; against *Panonychus ulmi*, against *Chaitophorus populellus*, 26; labelled with  $^3\text{H}$ , penetration and metabolism of, in insects, 27; effects of, on bioassay of Bidrin, 28; ineffective against *Miccotrogus picrostris*, 29; ineffective against *Hylemya brassicae*, 36; against *Sitona cylindricollis*, 40; against *Contarinia*, against *Megastigmus spermatrophus*, toxicity of, to Douglas fir, 44; against *Eriosoma lanigerum*, suppressing activities of *Pheidole megacephala*, 73; toxicity of, to *Cydia pomonella*, 75; susceptibility of *Dermestes* to, 78; tests of, against *Brachycolus noxius*, 83; toxicity of, to pests of vegetables and fruit trees, methods of determining residues of, in vegetables and fruit trees, metabolism of, in sugar and fodder-beet, and question of residues of, method for determination of, in commercial formulations, 92; against *Dacus oleae*, tests of, against Coccids, 94; metabolism of, labelled with  $^{32}\text{P}$  in olives, systemic migration and insecticidal activity of, on tree trunks, 116; cotton impregnated with, against *Paranthrene tabaniformis*, 127; oil reducing toxicity of, to *Pauridia peregrina*, 132; and dieldrin, *Icerya purchasi* and other Coccids, in sprays against *Zeuzera pyrina*, *Cydia pomonella*, *Ceratitis capitata*, *Lobesia botrana* and *Paralobesia viteana*, 135; and oil emulsion, against *Parlatoria blanchardii*, toxicity of, to *Pharoscymnus numidicus*, 144; in sprays against *Myzus persicae* and *Aphis gossypii*, 146; as drench against *Macrosiphum solani*, 160; in sprays against *Toumeyella pinicola*, 164; in sprays against *Myzus persicae*, 166; synergism of, against *Anthonomus grandis*, 169; effect of, on *Citrus*, in sprays against Coccids, 207; against *Liriomyza munda*, and oil emulsion, in sprays against Coccids, 208; and DDT, in sprays against *Thrips nigropilosus* and *Tetranychus luedeni*, 213; in sprays against *Stigmella malella*, 228; against aphids, in sprays against *Plutella maculipennis* and pigeons, 230; in sprays against *Tetranychus telarius*, 232; against *Tribolium* spp., 254; applied to seed furrow against *Atherigona indica*, 262; in sprays against *Nola distributa*,

- 265; residues of, on soybean, maize, and grass forage, 273; in sprays against *Lygus hesperus* and *Frankliniella occidentalis*, 276; against *Musgraveia sulciventris*, 314; against *Pseudococcus comstocki*, 320; applied from aircraft against aphids, residues of, on vegetable crops, 363; oxygen analogue of, persistence of, on and in oranges and in cattle feed, 374; not toxic to oranges, in sprays against *Aonidiella aurantii*, 393; against *Helopeltis theivora*, 397; in granules and drenches against *Tetranychus marianae*, 415; in sprays against *Petrobia latens*, 449; tests of, in sprays against Coccids on papaya, 450; soil treatment with, in granules against aphids, 469; toxicity of, in sprays, to predacious insects, 471; in sprays, against *Andraca bipunctata*, 482; effect of temperature on, against *Cotinis nitida*, 485; in sprays against *Heliothis zea*, alone and in emulsions, in sprays against *Stomacoccus platani*, 486; in sprays against *Blissus leucopterus*, 499; in sprays against *Pissodes sitchensis*, 500; in sprays against *Rhagoletis cerasi*, 514; in sprays against *Dasyneura pyri*, resistance to, in *Tetranychus telarius*, 515; against *Rhopalosiphum padi*, volatility and ability of, to move through soil, in relation to absorption of, by wheat, movement of, in *Theobroma cacao*, 532; seed treatments with, against *Sitona* spp., and effect of, on plants, 550; in sprays against *Pegomya betae*, 551; and oils, in sprays against *Leucoptera coffeella*, 578; in sprays against *Ceratitis capitata*, 613; penetration and translocation of, in plants, 622; in sprays against *Bryobia rubrioculus*, 640; in sprays against *Neodiprion taedae linearis*, 643; in sprays against *Rhynchaenus fagi*, 658
- 2-(Dimethoxyphosphinylimino)-4-methyl-1,3-dithiolane, against *Hypera variabilis*, 497
- Dimethrin, chemical definition of, 2
- 1,1-Dimethyl-3-(p-acetamidophenyl) triazene, effects of, against *Phthorimaea operculella* on potato and egg-plant, and against *Chilo agamemon* on maize, 339
- 4-Dimethylamino-3,5-xylyl Methylcarbamate (see Zectran)
- 2,4-Dimethylbenzyl Chrysanthemate, (see Dimethrin)
- Dimethyl 4-Bromo-2,5-dichlorophenyl Phosphate, in stored wheat grains, 600
- O,O-Dimethyl O-4-Bromo-2,5-dichlorophenyl Phosphorothioate (see Bromophos)
- O,O-Dimethyl S-2-Carbamoyloxyethyl Phosphorodithioate, toxicity of, to phosphorus-resistant and susceptible mites, 282
- Dimethyl 1-Carbamoyl-1-propen-2-yl Phosphate, as metabolite of dimethyl 1-methylcarbamoyl-1-propen-2-yl phosphate, 507
- Dimethyl 2-Chloro-1-(2,4-dibromophenyl) vinyl Phosphate, toxicity of, to *Distantiella theobroma*, 72
- Dimethyl 2-Chloro-1-(2,4-dichlorophenyl) vinyl Phosphate, toxicity of, to *Distantiella theobroma*, 72
- O,O-Dimethyl O-2-Chloro-1-(2,4-dichlorophenyl) vinyl Phosphorothioate, against *Lasioderma serricornis*, 583
- Dimethyl 2-Chloro-1-(2,4,5-trichlorophenyl) vinyl Phosphate, against *Spodoptera frugiperda* and *Heliothis zea*, residues of, on maize, 280; in sprays against *Argyrotaenia velutinana*, persistence of, on grape foliage, 358; in sprays against *Lymantia dispar*, 491; in sprays against *Chlamisus cribripennis*, 581; in sprays against *Neodiprion taedae linearis*, 643
- O,O-Dimethyl S-2,5-Dichlorophenylthio-methyl Phosphorodithioate, alone and with oil emulsions, in sprays against *Thrips tabaci*, 590
- O,O-Dimethyl S-(2,3-Dihydro-5-methoxy-2-oxo-1-,3,4-thiadiazol-3-ylmethyl) Phosphorodithioate (see Methidathion)
- Dimethyl 1,3-Dimethoxycarbonyl-1-propen-2-yl Phosphate, in sprays against *Myzus persicae*, 166; in sprays against *Heliothis zea*, 486
- Dimethyl 1-Dimethylcarbamoyl-2-chloro-1-propen-2-yl Phosphate, effects of, on bioassay of Bidrin, metabolite of Bidrin, 28
- Dimethyl 1-Dimethylcarbamoyl-1-propen-2-yl Phosphate, against *Panonychus ulmi*, 26; against *Chaitophorus populellus*, 27; studies to develop a specific method for the bioassay of, toxicity of, to Diptera, labelled with radioisotopes, with synergists, metabolism of, toxicity of, to *Musca domestica*, against *Diabrotica undecimpunctata*, persistence of, in soil, 28; against *Sitona cylindricollis*, 40; against *Contarinia* and *Megastigmus spermotrophus*, toxicity of, to Douglas fir, 44; seed treatment with, against thrips, 165; in sprays against *Myzus persicae*, 166; synergism of, against *Anthonomus grandis*, 169; in sprays against *Spodoptera litura*, 223; colorimetric analytical method for residues of, 240; in sprays against *Lygus hesperus* and *Frankliniella occidentalis*, 276; bioassay method for determining residues of, 344; in sprays, disappearance of residues of, from lucerne, 370; persistence of, on and in oranges and in cattle feed, 374; in drenches and sprays, against *Tetranychus marianae*, effects of, on plants, 415; in sprays against *Pissodes sitchensis*, 500; separation and measurement of residues of, in crops, analysis of, by electron capture and gas-liquid chromatography, 524; and oils, in sprays against *Leucoptera coffeella*, 578; in sprays against *Anthonomus grandis*, 580; toxicity of, to Tetranychid mites, 585; treatment of pine with, for control of *Diprion similis*; effective against *Aphrophora parallela*; harmless to *Monodontomerus dentipes*, 588; against *Aegeria pictipes*, 590; in sprays against *Neodiprion taedae linearis*, 643; development of resistance to, in *Psylla pyricola*, 643
- O,O-Dimethyl O-p-Dimethylsulphamoylphenyl Phosphate, levels of, in insects and mice, 188
- O,O-Dimethyl O-p-Dimethylsulphamoylphenyl Phosphorothioate, oxygen analogue of, toxicity and metabolism of, in insects and mice, 188



- O,O-Dimethyl S-(5-Ethoxy-2,3-dihydro-2-oxo-1,3,4-thiadiazol-3-ylmethyl) Phosphorodithioate (see Lythidathion)
- O,O-Dimethyl S-(N-Ethylcarbamoylmethyl) Phosphorodithioate (see Ethoate-methyl)
- Dimethyl 3-Hydroxyglutaconate Dimethyl Phosphate (see Dimethyl 1,3-Di(methoxycarbonyl)-1-propen-2-yl Phosphate)
- Dimethyl 1-Hydroxymethylcarbamoyl-1-propen-2-yl Phosphate, as metabolite of Dimethyl 1-Methylcarbamoyl-1-propen-2-yl Phosphate, 507
- O,O-Dimethyl S-2-Methoxyethyl-carbamoylmethyl Phosphorodithioate, in spray against *Alabama argillacea*, 243; guide to, 297; in sprays against *Oligonychus coffeae* and *Calacarus carinatus*, 398
- O,O-Dimethyl S-((2-Methoxy-5-oxo- $\Delta^2$ -1,3,4-thiadiazolyn-4-yl)methyl) Phosphorodithioate (see Methidathion)
- O,O-Dimethyl S-(5-Methoxy-1,3,4-thiadiazol-2-(3H)-on-3-ylmethyl) Dithiophosphate (see Methidathion)
- O,O-Dimethyl S-Methylcarbamolymethyl Phosphorothioate, as metabolite of dimethoate, 27, 92, 374
- Dimethyl 1-Methylcarbamoyl-1-propen-2-yl Phosphate, effects of, on bioassay of Bidrin, toxicity of, to *Musca domestica*, 28; against *Contarinia*, and *Megastigmus spermatophus*, systemic treatment of Douglas fir with, 44; stem applications of, by brush and in sprays against *Psallus seriatus*, in sprays against *Argyrotaenia velutinana*, persistence of, on grape foliage, 358; against *Lygus lineolaris*, 496; in sprays against *Pissodes sitchensis*, 500; metabolism of, by insects and rats, 507; separation and measurement of residues of, in crops, 524; stem treatment with, in granules against cotton pests, 589; systemic activity of, in cotton plants, assay of, using *Aphis gossypii*, *Anthonomus grandis* and *Tetranychus telarius*, 589; stem treatment with, against *Lygus hesperus*, 595; in sprays against *Neodiprion taeda* and *linearis*, 643
- 3,5-Dimethyl-4-methylthiophenyl N-Methylcarbamate (see Methiocarb)
- O,O-Dimethyl S-((2-Oxo-3-benzoxazolinyl)methyl) Phosphorothioate, in sprays against *Argyrotaenia velutinana*, persistence of, on grape foliage, 358; reduction in reproductive capacity of *Panonychus ulmi* by, 369; against *Psylla pyricola*, 643
- 3-(2-(3,5-Dimethyl-2-oxocyclohexyl)-2-hydroxyethyl) Glutarimide, and derivatives applied in sprays against *Panonychus citri* and *Tetranychus pacificus*, oxime derivative of, controlling *Phyllocoptruta oleivora*, phytotoxicity of, to plants, 269; effect of, on *Tetranychus telarius*, 484; effects of, on reproduction of *Myzus persicae*, 496
- O,O-Dimethyl Phosphoric Acid, as metabolite of dimethoate, 92
- O,O-Dimethyl Phosphorothioic Acid, as metabolite of dimethoate, 92
- Dimethyl Tetrachloroterephthalate, and insecticides, effect of, on cotton seedlings, 596
- Dimetilan, survey of data on, 81; in granules applied in planting water, against *Myzus persicae*, 355; in drenches, granules and seed treatment with, against *Hylemya antiqua*, 356; against *Hypera variabilis*, 497; treatment of pine with, for control of *Diprion similis*, effective against *Aphrophora parallela*, harmless to *Monodontomerus dentipes*, 588
- Dimite (see DMC)
- 2,4-Dinitro- $\alpha$ -naphthol, wool serge dyed with, reducing damage by *Acheta domesticus*, protecting woollen fabric against *Tineola bisselliella*, 125
- 2,4-Dinitrophenylhydrazones, determination of pyrethrins by chromatography of, 404
- Dinobuton, chemical definition of, 2; survey of data on, 81; not effective against *Panonychus ulmi*, 284
- Dinocap, against *Panonychus ulmi*, 26; in sprays against *Panonychus ulmi*, susceptibility of *Blepharidopterus angulatus* to spray programmes of, effect of, on *Typhlodromus pyri*, 470; suppression of *Panonychus ulmi* by, in sprays against *Podosphaera leucotricha*, 498
- Dinocton, chemical definition of, 2
- Dinopenton, chemical definition of, 2
- Dinorhynchus dybowskii*, predacious on *Gastrolina thoracica* in Soviet Union, 11
- Dinoseb-ammonium, with parathion, in sprays against *Panonychus ulmi*, 325
- Dinosulfon, chemical definition of, 2
- Dinoteron, chemical definition of, 2
- Dinozan, in sprays, against *Panonychus ulmi*, 325
- 2,3-Dinydro-2,2-dimethyl-7-benzofuranyl Methylcarbamate, as side-dressing, against *Myzus persicae*, 355
- Dioryctria abietella*, *Hapleginella laevifrons* associated with, on pine in Soviet Union, 193; parasitised by *Lissonota dubia* and *Apanteles parasitellae* in Germany, 564
- Dioryctria abietivorella*, on pine in Florida, 62
- Dioryctria amatella*, on pine in Florida, 62; attacking cones of *Pinus taeda* and *P. echinata* in Arkansas, 303
- Dioryctria clarioralis*, on pine in Florida, 62; attacking cones of *Pinus taeda* and *P. echinata* in Arkansas, 303
- Dioscorea*, *Hepialiscus sordida* on, in Java, 177; Dynastids on, in Nigeria, 570
- Diopilus capito*, parasitising *Meligethes aeneus* on rape in Sweden, 182
- Dioxathion, against *Liriomyza munda*, surface-active agents added to sprays of, 208; in sprays against *Argyrotaenia velutinana*, persistence of, on grape foliage, 358; and DDD, in control of *Cydia pomonella*, 448
- Diparopsis castanea*, effectiveness of sprays against, on cotton, 334; comparison of aerial and ground sprays against, on cotton in Rhodesia, 474
- Diparopsis watersii*, on cotton in Somalia, 380; control of, on cotton in the Sudan, 656
- Diphenylmethane, not improving residual action of pyrethrins, 225
- Diplazon ornatus*, parasitising *Syrphus vitripennis* in Poland, 96
- Diplazon tarsatorius*, parasitising *Sphaerophoria* in Poland, 96

- Diplazon tricinctus*, parasitising *Syrphus balteatus* in Poland, 96
- Diplocladia natalensis*, *Prolasioptera berlesiana* reared on, 637
- Dipriocampe diprioni*, parasitising *Neodiprion sertifer* on pine in Czechoslovakia, 200
- Diprion nipponicus*, occurrence and parasites of, on larch and pine in Japan, 660
- Diprion pini*, tests of biological control of, 99; natural enemies of, on pine in France, 106; outbreaks of, parasites and predators of, on pine in Germany, 378; annual cycle of development of, on pine in Germany, 562
- Diprion similis*, infesting pine in Soviet Union, 140; systemic insecticides against, on pine in Wisconsin, 588
- Dipterex (see Trichlorphon)
- Dirhicnus alboannulatus*, introduction of, into previously uninfested area, parasitising *Sphinx pinastri* in Germany, 99
- Distantiella theobroma*, susceptibility or resistance to insecticides in, on cacao in Ghana, 72; relation of diet to egg production of, 109; sprays against, on cacao in Ghana, procedure following discovery of resistance to chlorinated hydrocarbons, 333; occurrence of, on cacao in Nigeria, tests for resistance to insecticides in, methods for rearing, 626
- District of Columbia, *Psara ipomoealis* on sweet potato in, 209; unusual form of *Phytomyza ilicicola* on *Ilex opaca* in, 540
- Disulfoton, against *Chaitophorus populellus*, 27; ineffective against *Hylemya brassicae*, 36; against *Psila rosae*, against *Hylemya brassicae*, 80; soil treatment with, in granules against *Aphis fabae*, effective against *Pegomya betae*, not effective against *Piesma* spp., 140; as drench against *Macrosiphum solani*, 160; in granules against *Mayetiola destructor*, 163; in granules against thrips, 165; soil treatment with, in dusts against *Cyrtomenus mirabilis*, 241; effect on cotton seed of soil treatment with, 242; in granules against *Macrostes fascifrons*, 285; soil treatment with, in granules against *Gossyparia spuria*, 286; in granules, against *Quesada gigas*, 299; as side-dressing, against *Myzus persicae*, 355; alone or with carbofenthion or fenthion against *Spodoptera littoralis*, 357; in granules, against *Limoniis canus*, 366; in granules against *Tetranychus marianae*, effects of, on plants, 415; soil treatment with, in granules against aphids, 469; in sprays against *Pissodes sitchensis*, 500; in granules against *Aphis fabae*, 513; against *Rhopalosiphum padi*, volatility and ability of, to move through soil, in relation to absorption of, by wheat, 532; soil treatment with granules of, against *Caviarella aegopodii*, 533; soil treatment with granules of, against *Macrosiphum pisum*, 534; in granules against aphids on potato and beet, 577; in granules and seed treatment with, against *Thrips tabaci* and *Phytomyza atricornis*, 584; apparent increases in *Capitophorus fragaefolii* caused by, 588; and herbicides, effect of, on cotton seedlings, 596; in granules against thrips, harmful interaction between fungicides and, 641
- Di-Syston (see Disulfoton)
- 3,5-Di-tert-butylphenyl N-Methylcarbamate, (see Butacarb)
- Dithiocarbamate, and other fungicides, in sprays against *Venturia inaequalis* not harming beneficial mites and insects, 122
- Diuron (see N'-(3,4-dichlorophenyl)-N,N-dimethylurea)
- DMC, against *Tetranychus telarius*, 164; toxicity of, to *Oligonychus indicus*, 318
- DNC, against *Aphis fabae*, 98; in spray against *Quadraspidiotus perniciosus*, 123; in sprays against *Enarmonia formosana*, 230; in oil emulsion and with fenson, in sprays against *Panonychus ulmi*, 325; against aphids on *Prunus mahaleb*, 327; in oil emulsion as spray against Coccids, 390; effect of, on numbers of *Panonychus ulmi*, and *Eulecanium corni*, 453; in sprays against *Argyresthia ehippella*, 553; and related compounds, for control of pests and diseases, 464; in sprays against *Panonychus ulmi*, susceptibility of *Blepharidopterus angulatus* to spray programmes of, effect of, on *Typhlodromus pyri*, 470; alone or with oil emulsions, in sprays against spider mites and *Psylla pyri*, 651
- Dociostaurus maroccanus*, in Iran, 519
- Dodder, in relation to transmission of witches'-broom viruses, 568
- Dodecachlorooctahydro-1,3,4-methono-2H-cyclobuta[cd]pentalone, treatment of woollen fabric with, against *Anthrenus* and *Attagenus*, 33; in baits for *Pogonomyrmex occidentalis*, 486; in baits for ants, 492
- Dodecyl-guanidine Acetate, not affecting *Panonychus ulmi*, 157
- Dodine (see Dodecyl-guanidine Acetate)
- Dogwood (see Cornus)
- Dolichos biflorus*, as ingredient in processed food bari, 399
- Dolycoris baccarum*, *Asolcus* spp. parasitising eggs of, in Soviet Union, 189; as alternative hosts for parasites of *Eurygaster integriceps* in Soviet Union, 549
- Doru lineare*, predacious on *Peregrinus maidis* in Venezuela, 300
- Doryphorophaga doryphorae*, laboratory rearing of, for control of *Leptinotarsa decemlineata* in France, 459
- Douglas Fir (see *Pseudotsuga menziesii*)
- Dowfume EB-15 (mixed ethylene dibromide, carbon tetrachloride, ethylene dichloride and inert ingredients), residues in milled wheat products from fumigation of mill machinery with, 373
- Dowfume EB-59 (mixed ethylene dibromide, carbon tetrachloride, and ethylene dichloride), residues in milled wheat products from fumigation of mill machinery with, 373
- Drino bohemica*, influence of the health of the host food-plant in host finding by, 21
- Drino gilva*, parasitising *Neodiprion sertifer* on pine in Czechoslovakia, 200
- Drino gilva aurora*, parasitising *Diprion nipponicus*, 660
- Drino inconspicua*, parasitising *Diprion pini*, 106; parasitising *Diprion pini* in Germany, 378



- Drosophila*, diet for, 30; inheritance of resistance to insecticides in, 315
- Drosophila melanogaster*, use of, in tests and bioassay of insecticides, 28; in tests of insecticides, 54, 93; effect of population density on susceptibility of, to endrin and parathion, 100; insecticide resistance in, 126; sex ratio in laboratory populations of, 180; use of flightless strain of, for bioassay of dieldrin residues in wheat, 202; scents attracting, 289; negatively correlated cross-resistance in, 315; used in tests for heptachlor and heptachlor epoxide, 359; insecticide resistance in, in Germany, 565; bioassay of exotoxin of *Bacillus thuringiensis* with, 598; combined effect of phosphorus insecticides and carbamates on, 599; persistence of behavioural resistance to DDT in, 634
- Dryinids, parasitic in *Deltocephalus glaucus* in Chile, 378
- Dryobota accipitrina*, on *Quercus ilex* in Spain, 255
- Duphar (see Malathion)
- Durofume Process, for control of insects in bagged foodstuffs, 215
- Dursban (see O,O-Diethyl O-3,5,6-trichloro-2-pyridyl Phosphorothioate)
- Dusts, equipment for applying, 44; against stored product pests, 614
- Dutch Guiana (see Surinam)
- Du-Ter (see Fentin Hydroxide)
- Dyes, used for marking adults and eggs of *Anthonomus grandis*, 404; use of, in tests with tepa against *Anastrepha ludens*, 499; tracer, for measuring aerial spray deposits in forests, 524
- Dylox (see Trichlorophen)
- Dyodiplosis glomeratii*, bionomics and parasites of, on *Ficus glomerata* in India, 478
- Dysdercus*, parasitisation of, by *Allophora*, 295
- Dysdercus andreae*, on *Citrus*, ornamental plants and cotton, in Florida, 543
- Dysdercus cardinalis*, control of, on cotton in Kenya, 134; on cotton in Somalia, 380; insecticide dusts against, and survey of, on cotton in Kenya, 624
- Dysdercus cingulatus*, synergised and unsynergised pyrethrum against, 662
- Dysdercus fasciatus*, insecticide dusts against, and survey of, on cotton in Kenya, 624; decline in importance of, as cotton pest in the Sudan, 656
- Dysdercus howardi*, *Entomoseius* gen. n. erected for *Treatia dysderci* on, in Trinidad, 205
- Dysdercus intermedius*, insecticide dusts against, and survey of, on cotton in Kenya, 624
- Dysdercus koenigii*, *Antilochus coquebertii* predacious on, in India, 501
- Dysdercus mimulus*, on *Citrus*, ornamental plants and cotton, in Florida, 543
- Dysdercus nigrofasciatus*, insecticide dusts against, survey of, on cotton in Kenya, 624; DDT applied by hand-operated spraying machines against, on cotton in Uganda, 625
- Dysdercus supersticiosus*, insecticide dusts against, and survey of, on cotton in Kenya, 624; DDT applied by hand-operated spraying machines against, on cotton in Uganda, 625; decline in importance of, as cotton pest in the Sudan, 656
- Dysdercus sutuarellus*, on *Citrus*, ornamental plants and cotton, in Florida, 543-545
- Dysmicoccus brevipes*, feeding on *Cyperus* spp. in Hawaii, 175; on groundnut in Somalia, 380

## E

- E605, E605f, E605 forte (see Parathion)
- E605 Staub (see Methyl-parathion)
- E1605 (see Parathion)
- EAG (see Electroantennogram)
- Earias*, control of, on cotton in Kenya, 134; comparison of aerial and ground sprays against, on cotton in Rhodesia, 474
- Earias biplaga*, chemical control of, on cotton in Uganda, 442; DDT applied by hand-operated spraying machines against, on cotton in Uganda, 625; factors affecting numbers of, on cacao in Nigeria; eggs of, parasitised by *Trichogramma luteum*, 625-627; decline in importance of, as cotton pest in the Sudan, 656
- Earias cupreoviridis*, on cotton in China, 265
- Earias fabia*, insecticides against, on cotton in India, 215; toxicity of insecticides to, on *Hibiscus esculentus* in India, 260; on cotton in China, 265
- Earias huegeli*, control measures against, on cotton and *Hibiscus trionum* in Queensland, 450
- Earias insulana*, *Bacillus thuringiensis* and insecticides against, 103; insecticides against, on cotton in India, 215; on cotton in Iran, 519; on *Malva sylvestris* in Israel, 612; decline in importance of, as cotton pests in the Sudan, 656
- Earias vittella*, on cotton in Queensland, 450
- Earthworms, effects of insecticides on, 80
- East Aden Protectorate, *Schistocerca gregaria* in, 597
- Ecballium elaterium*, *Epilachna chrysomelina* on, in Sicily, 609
- ECE (see BHC)
- Echinochloa*, not suitable as food plant for *Lema melanopa* in Indiana, 307
- Echinochloa crusgalli*, *Lissorhoptrus oryzophilus* on, in California, 161
- Echinochloa pyramidalis*, *Nomadacris septemfasciata* occurring in associations of, in Mali, 234
- Echinochloa stagnina*, *Nomadacris septemfasciata* occurring in associations of, in Mali, 234
- Echinonemus oryzae*, sprays against, on rice in India, 441
- Ecology, advances in research in, 297
- Ecpantheria icasia*, bionomics and natural enemies of, on banana in Costa Rica, 645
- Ectomyelois ceratoniae*, infestation and control of, on pomegranate in Saudi Arabia, 211; attacking nuts of *Pinus halepensis* in Spain, 255
- Ectophasia crassipennis*, reared from *Eurygaster integriceps* and other insects in Soviet Union, 549

- Ecuador, *Aleurocanthus woglumi* in, 172  
 EDB-60, (mixed ethylene dibromide, carbon tetrachloride and ethylene dichloride), fumigant residues from, in milled wheat products, 373  
 Egg-plant (see *Solanum melongena*)  
 Egrets (see *Egretta*; *Bubucus*)  
*Egretta garzetta*, as predator of *Nomadacris septemfasciata* in Tanganyika, 627  
 Egypt, archaeological records of *Sitophilus granarius* in, 56; *Tetranychus cinnabarinus* infesting cotton in, 164; *Spodoptera littoralis* on cotton in, 213, 269, 357, 472; varietal resistance to *Spodoptera littoralis* in cotton in, 258; effect of insecticides on properties of cotton in, 441; *Habrolepis fanari* sp.n., parasitising *Chrysomphalus ficus* in, 462; insecticide treatments against maize borers in, 472; control of Coccids on *Citrus* in, 473; control of *Eyprepocnemis plorans* on cotton in, 473; control of *Spodoptera littoralis* and spider mites in cotton fields in, 474; *Adactylidium* sp., as predator of eggs of *Gynaikothrips ficorum* in, 538; *Euzophera osseatella* in, 611  
 E.I. 18706 (see Ethoate-methyl)  
 E.I. 43064 (see 2-(Diethoxyphosphinothioyl) imino)-1,3-dithiolane)  
 Ekadrin (mixture of thiometon and endrin), in spray against *Alabama argillacea*, 243  
 Ekatin (see Thiometon)  
 Ekatox (see Parathion)  
*Elaeis guineensis*, *Oryctes rhinoceros* on, in Malaya, 178; pollen of, removed by *Apis dorsata* in India, 480; *Strategus aloeus* on, in Colombia, 577; *Rhynchophorus palmarum* and red-ring disease in, in Surinam, 639  
*Elasmopalpus lignosellus*, bionomics of, on cowpea, attacking grass and leguminous crops in Georgia, 169; insecticidal and cultural control of, on cowpeas in Georgia, 206 bionomics of, infesting soy bean and cowpea in Georgia, 579  
 Electric Fields, for controlling insect pests in stored wheat, 490  
 Electroantennogram, for measuring reception of odours by *Lymantria dispar*, 620  
 Electron Affinity, of BHC isomers, 180  
 Electron Capture, analysis of Dimethyl 1-Dimethylcarbamoyl-1-propen-2-yl Phosphate by, 524  
 Electrons, Accelerated, effect of, on *Sitophilus granarius*, 252  
*Eleodes*, attacking wheat in South Dakota, 270  
*Eleodes suturalis*, colonization and mass production of, insecticides against, 270  
*Eleusine coracana*, phytotoxic effects of insecticides used as seed, foliage or soil treatments on, 263; *Thosea aperiens* on, in India, 663  
 Elk, DDT residues in, in United States, 641  
*Elliptio complanatus*, dieldrin residues in, 586  
 Elm, Bark-beetles on, in Soviet Union, 89; *Aulonium trisulcum* preying on *Scolytus* spp. on, in Spain, 128; *Scolytus* spp. on, in Soviet Union, *Scolytus sulcifrons* in relation to *Ceratocystis ulmi* in, in Soviet Union, 142; Longicorns on, in Soviet Union, 143; *Ceratocystis ulmi* in galleries of *Hylastes rufipes* on, in Ontario, 179; *Cosmia diffinis* on, in Spain, 255; *Xyloterinus politus* associated with fungus disease of, in Quebec, 502; *Scolytus scolytus* on, in Britain, 650 (see also *Ulmus*)  
 Elm, American (see *Ulmus americana*)  
*Elodia tragica*, parasitising *Tortrix viridana* on oak in Portugal, 295  
 El Salvador, mites of subfamily Phytoseiinae in, 211; *Bemisia tabaci* on cotton and other plants in, 401  
*Elymnias caudata*, bionomics of, on *Areca catechu* in India, and *Brachymeria* sp. parasitic in, 664  
 Emcol E-607 (see N-(Lauroyl Colaminoformyl-methyl) pyridinium Chloride)  
*Empoasca curveola*, parasitised by *Anagrus armatus*, and attacking crops in Chile, 377  
*Empoasca devastans*, on *Hibiscus esculentus* in India, natural enemies of, 86; insecticides against, on cotton in India, 215; *Entomophthora* sp. on, in India, 343  
*Empoasca fabae*, aggregations of, in lucerne fields in Wisconsin, biological notes on, in Wisconsin, 307; evaluation of lucerne for resistance to, in Nebraska, 365; effect of temperature on development of, in Illinois, 412; damaging sweet clovers in Nebraska, 498; traps for, and local flight habits of, on lucerne in Wisconsin, 582  
*Empoasca flavescens*, effect of sprays against other pests of tea on, in India, 397  
*Empoasca lybica*, not affecting populations of *Bemisia tabaci* on cotton in the Sudan, 258; populations of, on hairy varieties of cotton in the Sudan, 475; distribution on cotton of, in Sudan, 529; effect of, on cotton in Sudan, and sprays against, 624  
*Empoasca paraobliqua* sp. n., attacking tea in Argentina, 180  
 Empusa (see *Entomophthora*)  
*Enarmonia formosana*, bionomics and control of, on apple in Soviet Union, 195; bionomics and control of, on apple in Britain, 229  
*Enarmonia ratzeburgiana*, natural enemies and bionomics of, on *Picea glauca* in Quebec, 349  
*Enarmonia rufimitrana*, attacking fir in Czechoslovakia, 517  
*Encarsia coquillettii*, as parasite of *Aleyrodes spiraeoides* in California, 369  
*Encarsia formosa*, biological studies on, and production of males of, 306; as parasite of *Aleyrodes spiraeoides* in California, 369  
*Encarsia lutea*, parasitising *Trialeurodes* spp. on cotton and sunflower in Arizona, 168  
*Encarsia meritoria*, as parasite of *Aleyrodes spiraeoides* in California, 369  
*Encarsia pergandiella*, parasitic in *Trialeurodes abutilonea* in Illinois, 304  
*Encarsia quaintancei*, parasitic in *Trialeurodes abutilonea* in Illinois, 304  
*Endasyus subclavatus*, parasitising *Neodiprion pratti pratti* in Virginia, 34  
*Endoclitia sericeus*, in Java, 177  
 Endosulfan, against *Hoplocampa* spp., 9; against *Leptinotarsa decemlineata*, 15; effects of humidity on persistence of, 47; against *Leptinotarsa decemlineata*, 52; against *Dasyneura tetensi*, 54; toxicity of, to *Spodoptera*



- littoralis*, 84; toxicity of, to *Coccinella septempunctata*, 85; against *Earias insulana*, 103; oil reducing toxicity of, to *Pauridia peregrina*, 132; against *Diatraea saccharalis*, 166; in sprays against *Myzus persicae*, 167; susceptibility of *Stenomalinia muscarum* to; 182; in sprays against *Acrobasis caryae*, 209; in sprays against *Spodoptera litura* 223; in dusts against *Oxycaenus hyalinipennis*, 243; swollen abdomens in *Cydia molesta* treated with, 276; against aphids, 301; toxicity of, to adults of *Dacus cucurbitae*, 316; in sprays against insect pests of apple, vines, and *Prunus*, 337; in sprays against Lepidopterous larvae, 348; in dusts, against *Myzus persicae* and *Macrosiphum ambrosiae*, 367; in sprays against *Odontothrips confusus*, 390; in sprays against *Scirtothrips bispinosus*, 397; effect of sprays of, on *Oligonychus ununguis* and *Contarinia* spp., 421; with DDT, effect of, against cotton pests on crop yields, 442; ineffective against *Scaphoideus littoralis*, 458; effect of, in drenches against *Steneotarsonemus laticeps*, on narcissus, in sprays for control of *Cecidophyopsis ribis* and black currant reversion virus, 470; in sprays against *Heliothis zea*, 486; labelled with  $^{14}\text{C}$ , metabolism, storage and excretion of, in mice, 488; in sprays against *Lygus lineolaris*, 496; in sprays against *Sitona* spp., 550; in sprays against *Phytomyza atricornis*, 584; in sprays against *Agrotis orthogonia*, in sprays against *Thrips tabaci*, against *Aegeria pictipes*, 590; tests of, against *Phthorimaea operculella*, 613; in sprays against *Chilo suppressalis*, *Tryporyza incertulas*, and *Sesamia inferens*, 615; ineffective in sprays against *Hypocala andremona*, 639; *Myzus persicae* not resistant to, 650; against *Tetranychus telarius*, 662
- Endosulfan Diol, as metabolite of endosulfan, 488
- Endosulfan Ether, as metabolite of endosulfan, 488
- Endosulfan Sulphate, as metabolite of endosulfan, 488
- Endothenia quadrimaculana*, bionomics of, on *Stachys sieboldii* in France; *Argyroproce antiquana* synonym of, 561
- Endothion, penetration and metabolism of, in insects, 228; and carbamates, against *Drosophila melanogaster*, 599
- Endrex, Endrex 20 (see Endrin)
- Endrin, against *Miccotrogus picirostris*, 29; effects of, on bees, 40; question of use of, against *Nacoleia diemenalis*, 41; effects of humidity on persistence of, 47; unsatisfactory against *Chilo suppressalis*, 48; toxicity of, to *Spodoptera littoralis*, 84; soil and seed treatment with, 91; susceptibility of *Drosophila melanogaster* to, 100; against *Earias insulana*, 103; in sprays against *Paranthrene tabaniformis*, 127; and mevinphos, in sprays against *Myzus persicae* and *Aphis gossypii*, 146; factors in effectiveness of, in granules against *Ostrinia nubilalis* 162; resistance to, in *Diatraea saccharalis*, 165; in sprays against cotton pests, and methyl-parathion, in sprays against *Myzus persicae*, 166; soil treatment with, against *Rhagoletis pomonella* and *Conotrachelus nenuphar*, 167; susceptibility to, in *Heliothis* reared on artificial diets, 170; and DDT, in sprays against cotton bollworms, 211; applied by aircraft in granules against *Diatraea saccharalis*, 212; in sprays against *Spodoptera littoralis*, 213; in sprays against *Amsacta moorei*, 214; toxicity of, to *Heterotermes indicola*, 216; toxicity of, to *Tribolium castaneum* and *Sitophilus oryzae*, 217; and DDT, in sprays against *Spodoptera litura*, 223; inconclusive results from, against *Enarmonia formosana*, 230; and thiometon, in spray against *Alabama argillacea*, 243; toxicity of, to *Amsacta moorei*, 259; persistence on *Hibiscus* of spray residues of, against *Earias fabia*, 260; toxicity of, to *Sitophilus oryzae*, toxicity of, to *Tribolium castaneum*, 261; in granules against *Atherigona indica*, 262; contact versus stomach toxicity of, to *Spodoptera littoralis*, 269; in sprays, against *Lema melanopa*, 302; toxicity of, to adults and larvae of *Dacus cucurbitae*, 316; in dusts, against Lepidopterous larvae, 348; in granules and soil treatment with, against *Conoderus* sp. and *Lachnosterna cribrata*, 364; in sprays against aphids, 376; toxicity of mulberry leaves sprayed with, to *Bombyx mori*, 377; soil treatments with, tolerance of larvae of *Nemolestes incomptus* to, 422; in sprays against *Echinocnemus oryzae*, effect of, on properties of cotton, 441; effect of, against cotton pests, on crop yields, 442; resistance to, in *Phthorimaea operculella*, 449; against *Earias huegeli*, 450; effect of, in drenches against *Steneotarsonemus laticeps*, on narcissus, in sprays for control of *Cecidophyopsis ribis* and black currant reversion virus, 470; and parathion, toxicity of, to *Spodoptera littoralis*, alone or with DDT, effects of, on maize yields, in sprays and granules against maize borers, 472; alone or with carbaryl, effect of, in sprays against cotton worms, on populations of spider mites, 474; in aerosols against *Pyrilla perpusilla*, 478; against *Chilo infuscatellus*, *Chilo auricilius*, *Scirpophaga nivella*, and termites, 479; in sprays against *Heliothis zea*, 486; resistance to, in *Hylemya brassicae*, 493; soil treatment with, against *Strategus jugurtha*, 577; in sprays against *Phytomyza atricornis*, 584; in sprays against *Agrotis orthogonia*, 590; tests of, against *Phthorimaea operculella*, 613; for protection of freshly felled timber in storage against insect borers and subterranean termites, in sprays against *Chilo suppressalis*, *Tryporyza incertulas*, and *Sesamia inferens*, 615; in sprays against *Empoasca lybica*, 624; development of resistance to, in *Psylla pyricola*, 643; in sprays against *Aleurolobus barodensis*, 664
- Endrosis lactella* (see *Endrosis sarcitrella*)
- Endrosis sarcitrella*, records of, infesting textiles in Germany, 521
- England, *Liriomyza bryoniae* on tomato in glasshouses in, 112
- Ennomus fuscantaria*, on ash in Spain, 255

- Ennomus subsignarius*, factors affecting colour of larvae of, and paired larval rearings of, with *Alsophila pometaria* in U.S.A., 540
- ENT 27005 (see 1,2,3,4,5,6,7,8-Nona-chloro-3a,4,7,7a-tetrahydro-4,7-methanoindan)
- Entobacterin, commercial preparation of *Bacillus thuringiensis galleriae*, *Euproctis chrysorrhoea* susceptible to infection by, 89
- Entobacterin-3, commercial preparation of spores of *Bacillus thuringiensis galleriae*, 430, 432
- Entomology, annual review of, 184; booklet of, 196; of radiation disinfestation of grain, 249-253; survey of, in India; Forest, in India, 316; Forest, text-book of, in Soviet Union, 319; literature on, published in 1962 in Finland, 403; applied, introduction to, 405; Finnish literature of, published in 1963, 571; bibliography of terminology in, 572; current problems in study of, in Mexico, 619
- Entomophthora*, on *Empoasca devastans*, in India, 343
- Entomophthora aphidis*, infesting aphids in Ontario, 44
- Entomophthora coronata*, pathogenicity of, to *Reticulitermes flavipes* in Indiana, 371
- Entomophthora fresenii*, infesting aphids in Ontario, 44
- Entomophthora muscae*, attacking Syrphids, 428
- Entomophthora syrphi*, attacking Syrphids, 428
- Entomophthora virulenta*, non-pathogenicity of, to *Reticulitermes flavipes* in Indiana, 371
- Entomoseius* gen. n. erected for *Treatia dysderci* on *Dysdercus howardi* in Trinidad, 205
- Enzyme Systems, activity of, in strains of *Tetranychus telarius* and *Musca domestica*, 117 (see also Cholinesterases)
- Eotetranychus pruni*, distribution of, on fruit trees in Soviet Union, 142; sprays against, on vines in Soviet Union, 509
- Eotetranychus sexmaculatus*, in Florida, 543
- Eotetranychus willamettei*, effect of predacious mites on population of, in vineyards in California, 579
- Ephedrus*, parasitising *Aphis fabae* in Poland, 97
- Ephedrus nitidus*, parasitising aphids in Holland, 121
- Ephedrus plagiator*, ineffective against *Hyalopteris pruni* in Czechoslovakia, 391
- Ephestia*, *Anagasta* as subgenus of, 3; BHC against, in stored wheat in India, 476; daylight reducing infestation of stored wheat by, in India, 477
- Ephestia elutella*, dichlorvos against, in stored tobacco in U.S.A., 355; susceptibility of, to *Bacillus thuringiensis*, 430
- Ephestia kuehniella*, colour forms of, 3; infected by *Bacillus* sp., *Devorgilla canescens* parasitising larvae of, *Melichares tarsalis* feeding on eggs of, 49; effect of  $\gamma$ -radiation on, 58; in Britain, 77; effect of temperature on, in flour mills, 77; effects of  $\gamma$ -radiation on, in Hungary, 324; not able to be infected artificially with *Adelina tribolii*, 427; outbreak of bacterial disease in larvae of, in France, 429; comparative effects of *Bacillus thuringiensis* against, and *Cydia pomonella*; susceptibility of, to *Bacillus thuringiensis*, 430; dichlorvos vapour against, in provender mill in Britain, 505; effect of  $\gamma$ -radiation on pupae and eggs of, 619
- Ephialtes*, parasitic in larvae of *Enarmonia ratzeburgiana* in Quebec, 349
- Ephialtes brevicornis*, parasitic in larvae of *Enarmonia ratzeburgiana* in Quebec, 349
- Ephialtes calobatus*, parasitising *Tortrix viridana* on oak in Portugal, 295
- Ephialtes comstockii*, abundance of, on pine in Maryland, 304; parasitic in *Cydia toreuta*, 596
- Ephialtes detritus*, parasitising *Hartigia nigra* in Holland, 382
- Ephialtes foliae*, parasitising larvae of *Heterarthrus ochropodus* in Italy, 331
- Ephialtes laiceps*, parasitising *Cydia conicolana* in Britain, 651
- Ephialtes manifestator* parasitising *Pissodes notatus* on pine in Spain, 128
- Ephialtes punctulatus*, entering farm buildings in Germany, 657
- Ephydra macellaria*, bionomics, injuriousness and control of, on rice in Soviet Union, 140
- Epicampoptera strandi*, on coffee in Ivory Coast, 108
- Epichorista ionephela*, bionomics and control of, on carnation in Denmark, plant hosts of, in South Africa, differences between *Cacoe-cimorpha pronubana* and, 345
- Epicometis hirta*, factors affecting efficiency of toxaphene against, on rape in Rumania, 461
- bionomics and control of, in vineyards in Sicily, 610
- Epidiopsis leperii*, winter control of, on apple and pear in Italy, 390
- Epilachna chrysomelina*, bionomics, food-plants and control of, in Sicily; *Tetrastichus epilachnae* reared from, 609
- Epilachna sprasa orientalis*, effect of aggregation on ecological characters of, 115; marking-and-recapture analysis of populations of, in Japan, 343
- Epilachna varivestis*, O,O-diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate against, on beans, 160; carbamate insecticides against, 186; toxicity of Schiff base phenyl N-methyl-carbamates to, 188; varietal resistance of beans to, in North Carolina, 586
- Epilachna vigintioctomaculata*, effect of aggregation on ecological characters of, 115
- Epilobium angustifolium*, defoliation of, by *Halicta tombacina* in British Columbia, 423
- Epirimerus*, sprays against, on vines in Soviet Union, 509
- Epirimerus pyri*, on pear in California, 38
- Epitrix hirtipennis*, injury to tomato varieties by, in Texas, 272
- Epizootics, study of, 432
- EPN, against *Chilo suppressalis*, 48, 147; as synergist for organophosphorus systemic insecticides, 169; toxicity of, to adults of *Dacus cucurbitae*, 316; toxicity of, to *Oligonychus indicus*, 318; in sprays against *Acrocercops cranerella*, 481; and carbamates, against *Drosophila melanogaster*, 599; in sprays against *Chilo suppressalis*, *Tryporyza incertulas*, and *Sesamia inferens*, 615; in dusts against *Phyrdenus muriceus*, 639



- Eupuraea*, abundance of, in relation to *Myelophilus piniperda* in Finland, 383
- Eranthemum*, sprays not affecting, 263
- Eretmocerus californicus*, as parasite of *Aleyrodes spiraeoides* in California, 369
- Eretmocerus haldemani*, parasitic in *Trialeurodes abutilonea* in Illinois, 304
- Eretmocerus serius*, release of, against *Aleurocanthus woglumi* on *Citrus* in Barbados, 172
- Eriborus*, parasitising *Bactra truculenta* on nutgrass in Hawaii, 175
- Erigeron canadensis*, *Aphis gossypii* on, in France, 457
- Eriophyes padi*, fungus disease of, on plum in England, 49
- Eriophyes pyri*, bionomics of, on apple in Chile, 47; on pear in Turkey, sprays against, 83; on plants in Poland, 633
- Eriophyes vitis*, sprays against, on vines in Soviet Union, 509
- Eriopsis connexa*, in Chile, destroying other insects, 48
- Eriosoma lanigerum*, on apple in Rhodesia, insecticides against natural enemies of, 73; insecticides against, 90; *Aphelinus mali* released against, on apple in France, insecticides against, injurious or not injurious to *Aphelinus mali*, 123; parasitism of, on apple in Italy, 330; bionomics of, in relation to *Aphelinus mali*, on apple in France, 391; varietal resistance of apple to, in Soviet Union, 509; vamidothion against, on apple in South Africa, 532
- Erizit (see Chlorobenzilate)
- Ernobia abietinum*, infesting pine in Germany, 237
- Ernobia mollis*, as scavenger in pine cones in Arkansas, 303
- Erosomyia indica* sp.n., infesting mango inflorescences in India, 477
- Erranis aurantaria*, effect of predation by birds on, in oak forest in Germany, 126
- Erranis defoliaria*, effect of predation by birds on, in oak forest in Germany, 126
- Erranis leucophaea*, effect on, of predation by birds in oak forest in Germany, 126
- Erwinia amylovora*, transmitted by *Aphis pomi*, 117
- Erysiphe cichoracearum*, combined control of *Tetranychus telarius* and, 652
- Erythmelus goochi*, parasitising *Quadraspidiotus perniciosus* in Germany, 102
- Eschata chrysargyria*, on bamboo in Java, 178
- Eserine, effects of, on mechanism of action of organo-phosphorus compounds on insects, 13
- Esterases, Wheat-germ, effect of, on malathion, 114
- Estigmene acraea*, light-trap catches of, on cotton in Texas, 30; tests of O-methyl O-p-methylthiophenyl methylphosphonothioate and related compounds against, on cotton, 357; insecticidal activity of alkylthiophenyl methylcarbamates in, 373; use of, in tests of effects of structure on biological activity of phenyl methylcarbamates, 420
- Ethanol, as attractant for *Rhynchophorus palmarum*, 42; phago-stimulants extracted from plant tissues with, 158; use of, in extraction of malathion residues from fruits, 187; use of, in extraction of *Melia azedarach*, 218; *Drosophila melanogaster* responding to, 289; use of, in extraction of parathion from olive oil, 394; use of, in extractions of rice bran, 548
- Ether, use of, in extractions of rice bran, 548
- Ethion, effects of humidity on persistence of, 47; in tests against *Cydia pomonella*, 93; seed treatment with, 105; in sprays against apple pests not harmful to beneficial insects, 123; and oil emulsion, against *Parlatoria blanchardii*, toxicity of, to *Pharoscyrnus numidicus*, 144; toxicity of, to cyclodiene-susceptible and cyclodiene-resistant strains of *Hylemya antiqua*, 163; ineffective in sprays against *Tetranychus telarius*, 164; and oil emulsion, in sprays against Coccids, 208; in sprays against *Tetranychus telarius*, 232; resistance to, in *Tetranychus pacificus*, 269 resistant strain of *Tetranychus pacificus* selected with, 282; in sprays against *Panonychus ulmi*, 284; against *Hylemya antiqua*, 356; in control of *Cydia pomonella*, 448; against *Psila rosae*, 469; and oils, in sprays against *Leucoptera coffeella*, 578
- Ethionine, effects of, on diet for larvae of *Ctenicera destructor*, 624
- Ethiopia, *Schistocerca gregaria* on cereals in, 51; revision of Nasutitermitinae in, 467; insects of cultivated and wild plants in, 529; *Schistocerca gregaria* in, 597
- Ethoate-methyl, chemical definition of, 2; in sprays against *Myzus persicae*, 166; in sprays against *Gymnoscelis pumilata*, 608
- Ethoam C/15 (see Ethoxylated Tertiary Amine)
- Ethopaz (see Ethion)
- S-(5-Ethoxy-2,3-dihydro-2-oxo-1,3,4-thiadiazol-3-ylmethyl) Dimethyl Phosphorothiothionate, (see Lythidathion)
- Ethoxylated Tertiary Amine, effect of, on deposits of DDT, 366
- Ethyl Acetate, *Drosophila melanogaster* not responding to, 289
- Ethyl-DDD, against *Psylla pyricola*, 38; effects of humidity on persistence of, 47; toxicity of, to *Spodoptera littoralis*, 84; in sprays against *Cheimophila salicella*, 267; and azinphos-methyl, in sprays against *Psylla pyricola*, 282; against *Psylla pyricola*, 643
- Ethyl 1,2-dibromo-2,2-dichloroethyl phenylphosphonate, mouse toxicity and anticholinesterase activity of, to *Ceratitis capitata*, 292
- Ethyl 2,4-Dinitro-6-tert.-butylphenyl Carbamate (see Dinoterbon)
- Ethyl Ether, as solvent for sex attractant of *Pectinophora gossypiella*, 500
- O-Ethyl S-Ethylthioethyl Methylphosphonothioate, effects of on central nervous system of insects, 13
- O-Ethyl S-(S-Methyl-S-Ethylthioethyl) Methylphosphonothioate, effects of, on central nervous system of insects, 13
- Ethyl-Methyl Guthion (see Axinphosethyl, and Azinphos-methyl)

- O-Ethyl S-p-Methylphenyl Ethylphosphonodithioate, against wireworms, effects of, on soil fauna, 80; persistence of, in treated soil, against *Costelytra zealandica*, 450
- O-Ethyl S-Phenyl Ethylphosphonodithioate against *Hylemya brassicae*, 36; applied to soil in granules against *Conoderus* spp., 274; in drenches, granules, and seed treatment, against *Hylemya antiqua*, 356; in granules, against *Limonijs canus*, 366; soil treatments with, against *Costelytra zealandica*, 450
- O-Ethyl O-2,4,5-trichlorophenyl Ethylphosphonothioate, against *Hylemya brassicae*, 36; against *Megastigmus spermotrophus*, and *Contarinia*, systemic treatment of Douglas fir with, 44; in sprays against *Myzus persicae*, 166; against *Limonijs canus*, 366; persistence of, in soil, treated for control against *Costelytra zealandica*, 450; toxicity of, to *Hylemya brassicae*, 493
- Ethylan BCP (see Nonyl Phenol-10 Ethylene Oxide)
- Ethylan CP (see Octyl Phenol-8 Ethylene Oxide)
- S-(N-Ethylcarbamoylmethyl) Dimethyl Phosphorothiolobionate (see Ethoate-Methyl)
- Ethylene Dibromide, toxicity of, to *Aonidiella aurantii*, 85; sorption of, by cereal products, 186; and methyl bromide, (as fumigant), against insect infestation in foodstuffs, 215; (as fumigant), effect of vapour pressure of, on mortality of stored product insects in vacuum fumigation, residual vapours in insects fumigated with, 253; (as fumigant), against *Eurytoma fellis*, 314; as soil fumigant, against larvae of *Limonijs canus*, 366; in mixture with other fumigants, residues of, in milled wheat products, 373; (as fumigant), in mixture with other fumigants against pests of stored products, 542
- Ethylene Dichloride, soil fumigation with, against *Leptinotarsa decemlineata*, 15; toxicity of, to *Aonidiella aurantii*, 85; sorption of, by cereal products, 186; in mixtures with other fumigants, residues of, in milled wheat products, 373; effects of, as fumigant for cardamom, 398; and Carbon Tetrachloride as fumigant for bagged wheat under tarpaulins, 399
- Ethylene Urea (see 2-Imidazolidinone)
- N-(2-Ethylhexyl) bicyclo [2,2,1]-5-heptene-2, 3-dicarboximide, as synergist, with Bidrin, 28
- Eublemma scitula*, attacking eggs of *Ceroplastes rusci*, 99
- Euborellia annulipes*, bionomics of, 537
- Eucalyptus*, *Phoracantha semipunctata* on, in Turkey, 83; Lepidoptera on, in Spain, 128; *Megalys fasciipennis* associated with *Phoracantha* spp. in logs of, in South Africa, 131; attacked by *Spodoptera littoralis* in Spain, 255; attacked by *Julodis onopordi* in Spain, 256; pests of granaries overwintering in bark of, in Portugal, 387; *Didymuria violascens* on, in Australia, 396; termites as pests of, in Uganda, 443
- Eucalyptus blakelyi*, *Paropsis atomaria* on, in Australia, 292
- Eucalyptus camaldulensis*, damaged by *Phoracantha semipunctata* in Tunisia, 245
- Eucalyptus cornuta*, damaged by *Phoracantha semipunctata* in Tunisia, 245
- Eucalyptus gomphocephala*, damaged by *Phoracantha semipunctata* in Tunisia, 245
- Eucalyptus lehmannii*, damaged by *Phoracantha semipunctata* in Tunisia, 245
- Eucalyptus occidentalis*, damaged by *Phoracantha semipunctata* in Tunisia, 245
- Eucepsis*, *Spatulifimbria castaneiceps* parasitised by, on castor, 260
- Eucoila pelleranoi*, transferred to genus *Ganaspis*, 288
- Eucosma criddleana*, corrected description of larvae of, in Canada, 402
- Eucosma monitorana*, method of rearing, on *Pinus resinosa* in Wisconsin, natural enemies of, in Wisconsin, 46
- Eucosma nigricana*, attacking fir in Czechoslovakia, 517
- Eucosma tedella*, natural enemies of, on spruce in Germany, 564
- Eucosma uddmanniana*, azinphos-methyl against, on loganberries in Britain, 470
- Euderus argyresthiae*, parasitising *Apanteles laricellae* and *Pimpla argyresthiae* in New Brunswick, 502
- Eutheola bidentata*, infestation and control of, on rice in British Guiana, 172
- Eugenol, affecting reproductive activity in *Schistocerca gregaria*, 605
- Eulan U33, *Acheta domesticus* damaging fabric treated with, protecting woollen fabric against *Tineola bisselliella*, 125
- Eulecanium caryae*, in Ontario, 203
- Eulecanium cerasifex*, in Ontario, 203; *cerasifex*, biological and behavioural differences between *E. putmani* and, 203; carbamate sprays in control of, on peach in Ontario, 352
- Eulecanium corni*, adaptation of *Blastothrix confusa* to bionomics of, in Soviet Union, 142; in Ontario, 203; effect of DNC on, on plum in Poland, 453
- Eulecanium coryli*, in Ontario, 203
- Eulecanium fletcheri*, species from *Thuja occidentalis* identified as, in Ontario, 203
- Eulecanium persicae*, in Ontario, 203; preyed on by *Coccophagus caridei* in Chile, 377
- Eulecanium putmani* sp. n., in Ontario, biological and behavioural differences between *E. cerasifex* and, 203
- Euleia fratria*, bionomics, parasitism and mating behaviour of, on *Heracleum lanatum* in California, 159
- Euleia heraclei*, use of scents to attract, in Britain, 399; dieldrin sprays against, on celery in Britain, 469
- Eulophus padellae*, parasitic in *Lithocolletis blancardella* in Roumania, 328
- Eumerus strigatus*, bionomics of, attacking onions in Soviet Union, 192
- Eumerus tuberculatus*, on onions in Soviet Union, 192
- Euonymus europaeus*, *Aphis fabae* on, in Poland, 96, 98; migration of *Aphis fabae* to beet from, in Czechoslovakia, 516
- Eupactus solidus*, damaging timber in houses in Spain, 389
- Euparacrias phytomyzae*, reared from *Lirio-myza* sp., in Chile, 377



- Eupelmus popa*, parasitising *Contarinia sorghicola* in Italy, 389
- Eupelmus urozonus*, parasitising *Dacus oleae* in France, 107, 108; laboratory rearing of, with *Ceratitis capitata* as host, 108
- Euphorbia hirta*, *Nipaecoccus vastator* on, in India, 86
- Euphorbia villosa*, relation of, to effectiveness of primary parasites of *Rhyacionia buoliana*, 90
- Euphoriana uniformis*, parasitising *Lygus* spp., in U.S.A., 583
- Euproctis*, attacking rubber trees in Territory of Papua and New Guinea, 480
- Euproctis chrysorrhoea*, susceptible to infection with *Bacillus thuringiensis galleriae*, 89; *Nosema* sp. infecting larvae of, in Poland, 427; effects of freezing temperatures on, in Soviet Union, 434
- Euproctis fraterna*, bionomics of, on *Ricinus communis* in India, 440
- Eupteromalus viridescens*, bionomics of, parasitising *Bathyplectes curculionis* in Delaware and New Jersey, 369
- Eupterote canaraica*, attacking *Amomum subulatum* in India, 440
- Eupterote fabia*, attacking *Amomum subulatum* in India, 440
- Eupulvinaria*, distinguishing characters of, 460
- Eupulvinaria hydrangeae*, classification, identification, and bionomics of, in France, 460
- Europe, parasites of *Tortrix viridana* on oak in, 123; natural food-plant of *Phrydiuchus topiarius* in, 273; *Rhynchaenus fagi* in, 658; larch pests and their parasites in, 660
- Eurydema*, *Asolcus* spp. parasitising eggs of, in Soviet Union, 189; as alternative host for parasites of *Eurygaster integriceps* in Soviet Union, 549
- Eurydema ornatum chloroticum*, bionomics and control of, on vegetables in China, 483
- Eurydema rugosum*, nymphal aggregation in, on rape in Japan, 547
- Eurygaster austriaca*, on wheat in Bulgaria, 554
- Eurygaster integriceps*, effect of spring temperature on fecundity of, on wheat in Soviet Union, 143; insecticides against, on wheat in West Pakistan, 144; sex ratio in, on wheat and barley in West Pakistan, early harvesting of wheat not practicable for control of, in West Pakistan, 145; *Asolcus* spp. parasitising eggs of, in Soviet Union, 189; outbreak of, in Soviet Union, 196; wind and migration of, in Middle East, 233; damage to wheat grains by, in Soviet Union, 321; protective activity in cuticle of, against *Beauveria bassiana*, 428; on wheat in Iran, 519; factors affecting population dynamics of, natural enemies of, chemical control of, on wheat in Soviet Union, 549; bionomics and control of, on crops in Bulgaria, 554; damaging maize in Soviet Union, 633
- Eurygaster maura*, wind and migration of, in Middle East, 233; on wheat in Bulgaria, 554
- Eurygaster testudinaria*, in West Pakistan, 145
- Eurysthaea scutellaris*, parasitising *Hyponomeuta padellus malinellus* in Yugoslavia, 392
- Eurytoma*, new species of, 68
- Eurytoma aciculata*, *Bracon* sp. parasitised by, in Spain, 246
- Eurytoma fellis*, bionomics, parasites and measures for control of, on *Citrus*, in New South Wales and Queensland, 314
- Eurytoma martellii*, parasitising *Dacus oleae*, 107
- Eurytoma onobrychidis*, bionomics and control of, on sainfoin in Bulgaria, 554
- Eurytoma pini*, parasitism by, of *Rhyacionia buoliana* on pine in Maryland, 304; parasitic in *Cydia toreuta*, 596
- Eurytoma platyptera*, control of, damaging clover in Chile, 408
- Eurytoma roddi*, olfactory response of, to chemicals in lucerne, 57
- Eurytoma tumoris*, bionomics of, on *Pinus sylvestris* in California, 68
- Euscelis*, in relation to transmission of witches'-broom viruses, 568
- Euscelis lineolata*, virus diseases of *Trifolium incarnatum* transmitted by, in Britain, 232
- Euscelis plebeja*, overwintering of clover phyllody virus in, 578; infected with beet crinkle virus, 657
- Euschistus atrox*, on rice in British Guiana, 171
- Euschistus conspersus*, bionomics of, on beans, 63
- Eutetranychus banksi*, on *Citrus* in Venezuela, 287; as pests of *Citrus* in Argentina and Uruguay, 376; effect of insecticides and acaricides on, on cotton in Egypt, 474; in Florida, 543-545
- Eutrombidium rostratum*, spermatophore production in, 116
- Euxesta notata*, susceptibility of, to insecticides, 27; diapause in, 202; selection for increased insecticide-irritability in, 236; method for mass rearing of, under controlled environmental conditions, in Canada, 363
- Euzophera magnolialis* sp.n., attacking magnolia in United States, 210
- Euzophera osseatella*, bionomics of, in Israel, food-plants of, in Mediterranean countries, 611
- Euzophera ostricolorella*, differences between *E. magnolialis* sp.n. and, 210
- Evagora milleri*, on *Pinus contorta* in California, tests of *Bacillus thuringiensis* against, 42
- Evergreen Magnolia (see *Magnolia grandiflora*)
- Evergreen Oak (see *Quercus ilex*)
- Evora hemidesma*, bionomics and parasites of, on *Spiraea vanhouttei* in Iowa, 410
- Excavarus*, parasitising *Pachynematus itoi* in Japan, 660
- Exenterus amictorius*, parasitising *Diprion pini*, 106; parasitising *Neodiprion sertifer* on pine in Czechoslovakia, 200
- Exenterus canadensis*, parasitising *Neodiprion pratti pratti* in Virginia, 34
- Exocentrus lusitanus*, infesting elms in Soviet Union, 143
- Exochomus flavipes*, preying on *Aonidiella aurantii* and *Coccus hesperidum* in South Africa, 129
- Exochus albifrons*, parasitising *Archips cerasivoranus* in Minnesota, 642

- Exorista fasciata*, parasitising *Malacosoma neustria* on oak in Portugal, 295; parasitism of *Dendrolimus pini* by, in Austria, 562
- Exorista pratensis*, parasitising *Periclista dusmeti* on oak in Portugal, 295
- Exorista rustica*, parasitising *Periclista dusmeti* on oak in Portugal, 295
- Exoristobia philippinensis*, parasitising *Trichopoda* spp., 174
- Exoteleia dodecella*, on pine in Poland, 98
- Exoteleia pinifoliella*, method for obtaining emerged adults of, from pine foliage, 179; bionomics and natural control factors of, on pine in Quebec, 347
- Eyprepocnemis plorans*, toxicity of toxaphene to, on cotton in Egypt, 473

## F

- Faba vulgaris* (see Beans, Broad)
- Fabric, pests of, in Canada, 571
- Fagus sylvatica*, chemical decomposition of, by termites, 406
- falcifera*, *Anagrapha*
- Falco biarmicus*, mortality of, in relation to organochlorine residues, in Britain, 400
- Falco peregrinus*, mortality of, in relation to organochlorine residues, in Britain, 400
- Famoxon (see O,O-Dimethyl O-p-Dimethylsulphamoylphenyl Phosphate)
- Famphur (see O,O-Dimethyl O-p-Dimethylsulphamoylphenyl Phosphorothioate)
- Far East, *Leptocoris* on rice in, 527; *Oryzaephilus surinamensis* in, 601
- Farnesol, effect of, on *Agria affinis*, 604
- Fat, gas-chromatographic measurement of toxaphene in, 664
- Fatty Acids, factors affecting, in *Hypera variabilis*, 413; transport of, in *Locusta migratoria* during flight, 620 (see also individual acids)
- Felt, as pupation medium for *Rhagoletis pomonella*, 162
- Fenchlorphos, resistance to, in *Sitophilus oryzae*, toxicity of, to *Sitophilus zeamais*, 4; toxicity of, to *Spodoptera littoralis*, 84; in baits against *Musca domestica*, 161; not toxic to oranges, in sprays against *Aonidiella aurantii*, 393; against *Psila rosae*, 469; against *Ceratitis capitata*, 613
- Feni Islands, *Deretrichia szentivani* sp.n., on *Theobroma cacao* in, 463
- Fenitrothion, against *Chilo suppressalis*, 48; susceptibility of *Dermestes* to, 78; against wireworms, effects of, on soil fauna, 80; in sprays against Coccids, 208; in sprays against cotton pests, 215; effect on successive generations of *Callosobruchus chinensis* treated with, 235; against *Tribolium* and *Dermestes* spp., antagonised by triphenyl phosphate, 254; against *Oryzaephilus surinamensis*, for protection of stored grain, 255; toxicity of, to *Amsacta moorei*, 259; determination of, on stored barley, 296; in sprays against *Argyrotaenia velutinana*, persistence of, on grape foliage, 358; toxicity of, to *Spodoptera littoralis*, 472; in sprays against *Dasyneura pyri*, 515; against *Halyomorpha picus*, 546; and oils, in sprays against *Leucoptera coffeella*, 578; against *Lasioderma serricorne*, 583; in sprays against *Thrips tabaci*, 590; in sprays against *Ceratitis capitata*, 613; in sprays against *Chilo suppressalis*, *Tryporyza incertulas* and *Sesamia inferens*, 615; persistence of deposits of,



- used in sprays against stored-product beetles, **622**; in dusts against *Phyrdenus muriceus*, in sprays against *Hypocala andromona*, **639**
- Fentin Acetate, effects of, against *Phthorimaea operculella* on potato and egg-plant, and against *Chilo agamemnon* on maize, **339**
- Fentin Hydroxide, effects of, against *Phthorimaea operculella* on potato and egg-plant, and against *Chilo agamemnon* on maize, **339**
- Ferbam, and other fungicides, in sprays against *Venturia inaequalis* not harming beneficial mites and insects, **122**
- Feronia melanaria*, dispersal of, on soil surface in Ontario, **201**
- Ferric Chloride, effects of, on deposits of DDT, **366**
- Ferrisia virgata*, distribution map of, **617**; transmission of swollen-shoot virus by, on cacao in Nigeria, **625**
- Fertilisers, effects of, in soil on *Rhyacionia buoliana* on pine, **522**
- Ferulic Acid, effects of, on termites, **406**
- Ficus carica*, *Udumbaria nainiensis* on, in India, **478**
- Ficus glomerata*, *Dyodiplosis glomeratii* on, in India, **478**
- Ficus nitida*, predator of eggs of *Gynaikothrips ficorum* on, in Egypt, **538**
- Ficus religiosa*, *Pipaldiplosis pipaldiplosis* on, in India, **84**
- Fig (see also *Ficus*)
- Fig, *Ceroplastes rusci* on, in Lebanon, **98**; *Oxycaenus hyalinipennis* on, in Tunisia, **243**; *Anicetus yasumatsui* sp.n. attacking *Ceroplastes* sp. on, in India, **295**; Tetranychid mites on, in Iran, **519**
- Fig, Dried, *Carpoglyphus lactis* on, in Portugal, **387**
- Figs (Stored), *Trogoderma versicolor* in, in Israel, **143**
- Fiji, parasites released against *Nacoleia octasema* in, **177**
- Filipjevimeris pologenzevi*, a new parasite of *Melolontha hippocastani* in Soviet Union, **115**
- Finland, *Dasyneura tetensi* on black currant in, **54**; survey of data on pests of cultivated plants in, **57**; *Myelophilus piniperda* on pine in, **383**; *Meligethes aeneus* in, *Neodiprion sertifer* on pine in, **384**; entomological literature published in 1962 in, **403**; use of pyrethrum against plant pests in, **404**; *Hylobius abietis* on conifers in, **563**; entomological literature of, published in 1963, **571**
- Fiorinia turpiniae*, new record of, in China, **523**
- Fir (see *Abies*)
- Fir, Balsam (see *Abies balsamea*)
- Fir, Douglas (see *Pseudotsuga menziesii*)
- Fir, Silver (see *Abies alba*)
- Fir, White (see *Abies concolor*)
- Fireweed (see *Epilobium angustifolium*)
- Fish, toxicity of insecticides to, **80**
- Fish (Dried), *Dermestes maculatus* infesting, residues of pyrethrins in, treatment of, **82**
- Fitios (see Ethoate-methyl)
- Flavobacterium*, against *Stilpnotia salicis*, **8**
- Flax, flea-beetles on, in Soviet Union, egg maturation of flea-beetles feeding on pollen of, **12**; virus disease of, in California, **71**; thrips on, in Holland, **341**; Auchenorrhyncha and Heteroptera on, in Sweden, **345**; *Petrobia latens* on, in Queensland, **449, 450**
- Fleabane (see *Erigeron canadensis*)
- Flies, *Lasioderma serricorne* recovered from dried bodies of, **422**
- Floods, effects of, on *Locusta migratoria*, **11**
- Florida, *Lachnosterna bruneri* on mahogany, litchi, citrus and peach in, **47**; *Dioryctria* spp. on pine in, **62**; *Dalbulus maidis* and stunt virus of maize in, **70**; survey of data on armoured scale insects of, **71**; *Aleurocanthus woglumi* in, **172**; *Citrus* scale insects in, *Scapteriscus* spp. attacking tobacco in, **207**; *Liriomyza munda* in, Coccids on *Citrus* in, **208**; side effects of treatments against *Solenopsis saevissima richteri* in, *Dialeurodes kirkaldyi* in, *Psara ipomoealis* on sweet potato in, *Acrobasis caryae* on pecan in, **209**; *Euzophera magnolialis* sp.n. attacking magnolia in, attraction of *Ips* spp. to artificially infested pine belts in, *Diaprepes abbreviatus* on *Citrus* in, **210**; *Anastrepha suspensa* in, **211**; *Xyela* spp. on pine in, **308**; *Liriomyza* sp. on tomato in, **356**; *Tetranychus telarius* on roses in, **358**; *Trialeurodes floridensis* on avocado in, **416**; insects and diseases of the pecan in, **463**; arthropod pests of, **543**; *Sathrobrotta rileyi* and other pests of maize in, **588**; aphid trap collections in, **589**; *Trioza tripunctata* on blackberry in, **649**
- Flour, insecticide residues in, **41**; Stored, use of  $\gamma$ -radiation against pests of, **58**; development of *Ptinus tectus* on, **76**; self-raising, *Dermatophagoides culinae* sp.n. preventing rising of, **208**; factors affecting development of *Tribolium* spp. in, **336**; chloropicrin residues in, after chamber fumigations, **375**; pests of, in Portugal, **387**; *Bacillus thuringiensis* in treatment of, **430**; piperonyl butoxide residues in, following paper bag treatment, **487**; insecticide contamination of, through package material, **582**
- Flour Mills, effect of temperature on insect infestation of, **77**; residues from fumigation of machinery in, with halogenated liquid fumigants, **373**; *Cryptolestes turcicus* in machinery of, in Britain, **504**
- Flowers, *Liriomyza* sp. on, in Chile, **377**
- Fluorine, in mixture against termite attack on beech and pine, **408**
- Fluoroacetamide, in sprays for control of *Cecidophyopsis ribis* and black currant reversion virus, **470**
- Fluorometric Method, for determining residues of azinphos-methyl in milk and animal tissues, **419**
- 5-Fluoroorotic Acid, effect of, on *Anthonomus grandis*, reversing effects of, by uracil or ribonucleic acid, **277**
- 5-Fluorouracil, effect of, on *Anthonomus grandis*, reversing effects of, by uracil or ribonucleic acid, **277**
- Fodder-beet, metabolism of dimethoate in, **92**
- Fodder Mill, *Ephestia kuehniella* in, **505**
- Foeniculum vulgare*, oil of, as attractant for insect pests, **399**
- Foliafume (see Nicotine, preparation of)

- Folic Acid, attractive to *Eurytoma roddi*, 57
- Folidol (see Parathion)
- Folidol-E 605 (see Parathion)
- Fololithon (see Fenitrothion)
- Folsomia quadrioculata*, on grass and white clover in Holland, in relation to injurious fungi, 383
- Fonithion (see Parathion)
- Forceps, method of repointing, for insect dissection, 404
- Forma olivacea*, not transmitting barley yellow-dwarf virus in South Dakota, 292
- Forest Pests, in Yugoslavia, 7; on Manchurian walnut in Soviet Far East, 11; sampling methods for, in British Columbia, 18; in pine plantations in Canada, 19; influence of temperature on, in Quebec; attacking cones or seeds of white spruce in Alaska, 21; attack by, in relation to felling date of trees in British Columbia, 22; natural factors controlling, in eastern U.S.A., 29; tests of control methods for, in West Virginia, 33; natural enemies of, in Virginia, 34; insecticides tested against, in Michigan, 36; tests of BHC against, in California, 41; measures against, in western U.S.A., 42; tests of systemic insecticides against, in U.S.A., 44; attacking pine cones in Wisconsin, 46; adults of *Lachnosterna bruneri* as, in Florida, 47; in Greece, 52; attacking fruit trees in France, 53; in Sweden; in Norway, 57; on young spruce trees; on poplar, in Germany, 59; host selection mechanisms in, in Wisconsin, 65; in Turkey, 83; in China, 89; on pine in Central Caucasus, 90; in Italy, 94; parasites of, in Poland, 98; bionomics of Lachnid spruce-inhabiting, in Germany, 99; in Czechoslovakia, 102; survey methods for estimating outbreaks of, in Soviet Union, 115; measures against, in France, 120; effect of birds on, in Germany, 126; in Spain, 128; attacking conifers in Soviet Union, 140; in Holland, 178; role of vertebrate predators in biological control of, 184; entomological papers of, 196; of Spain, 255; biology and occurrence of Anobiid, in Poland, 324; virus diseases of, in Spain, 431; viruses in biological control of, in Canada, 432; parasites of, in Soviet Union, 508
- Forest Entomology, in India, 316; text-book of, in Soviet Union, 319
- Formaldehyde, in diets for insects, 34; against bacterium on eggs of *Anthonomus grandis*, 579
- Formica aquilonia*, distribution and ecology of, in eastern Alps, 655
- Formica cordieri*, distribution and ecology of, in eastern Alps, 655
- Formica exsecta*, distribution and ecology of, in eastern Alps, 655
- Formica integriceps planipilis*, *Cinara* associated with, on *Pseudotsuga menziesii* in Washington State, attacking *Pseudotsuga menziesii* associated with, in Washington, 152
- Formica lugubris*, introduction of, to mixed forests in Sardinia, 628; distribution and ecology of, in eastern Alps, 655
- Formica nigricans*, distribution and ecology of, in eastern Alps, 655
- Formica polycetena*, distribution and ecology of, in eastern Alps, 655
- Formica rufa*, distribution and ecology of, in eastern Alps, 655
- Formica sanguinea*, distribution and ecology of, in eastern Alps, 655
- Formica truncorum*, distribution and ecology of, in eastern Alps, 655
- Formosa, *Chilo suppressalis* on rice in, 48; *Nephotettix* sp. in, 87; *Pteroptrix albocincta* sp. n. from *Aonidiella citrina* in, 304; *Panonychus citri* on *Citrus* in, 315; diseases and pests of economic plants of, 528
- Formothion, in sprays against *Cydia pomonella*, 227; in sprays against *Zeuzera pyrina*, 228; tests of, in sprays against aphids, 386; in sprays against *Oligonychus coffeae* and *Calacarus carinatus*, 398; in sprays against *Scaphoideus littoralis*, 458; in sprays against *Rhagoletis cerasi*, 514
- Forst-Viton (see BHC)
- Foschlor (see Trichlorphon)
- Fosdrin 25 (see Mevinphos)
- Fosferno (see Parathion)
- Fostion (see Malathion)
- Fowls, bromide residues in tissues and eggs of, from ingestion of methyl bromide-fumigated feed, 240; larvae and pupae of *Dendrolimus spectabilis* as food for, 635
- Fragaria vesca*, flowering of, in relation to *Hyponomeuta padellus malinellus*, 98
- France, *Ceratitis capitata* in, *Leptinotarsa decemlineata* on potato in, 52; *Rhynchaenus fagi* on fruit trees in, 53; pests of forest trees in, 53, 121; *Hylemya coarctata* on wheat in, 105; *Diprion pini* on *Pinus sylvestris* in, 106; *Dacus oleae* on olive in, 107, 108; *Melolontha melolontha* on lucerne and grassland in, 120; integrated control in orchards in, 123; parasites of *Microlarinus* spp. in, 170; *Pegomya betae* on beet in, 224; use of *Prospaltella perniciosi* against *Quadraspidiotus perniciosus* in, 225; new type of virus disease in *Galleria mellonella* in, *Cnephasia virgaureana* on beet in, *Contarinia pisi* on pea in, *Contarinia lentis* on lentil in, 226; *Melanogryllus desertus* damaging vines in, *Zeuzera pyrina* on apple in, *Cydia pomonella* on apple in, 227; *Stigmella malella* on apple in, 228; *Anarsia lineatella* and *Cydia molesta* in, 333; *Coccinella septempunctata* in, 344; *Odontothrips confusus* on lucerne in, 390; *Aphelinus mali* as parasite of *Eriosoma lanigerum* in, 391; milky disease of *Melolontha melolontha* in; microsporidiosis caused by *Nosema melolonthae* in larvae of *Melolontha melolontha* in, 427; bacterial disease in larvae of *Ephesia kuehniella* in, 429; *Thaumetopoea pityocampa* on pine in, 432; aphids and cucumber virus in, 457; *Phylloxera vitifoliae* damaging vines in, 457; control of *Scaphoideus littoralis* as vector of golden-flavescence disease of vines in, 458, 459; use of *Doryphorophaga doryphorae* against *Leptinotarsa decemlineata* on potato in, 459; nutrition of larvae of *Melolontha melolontha* in, *Eupulvinaria hydrangeae* in, 460; Coccinellids attacking aphids in, 559; infestation by *Reti-*



- culitermes santonensis* in, 560; *Endothenia quadrimaculana* on *Stachys sieboldii* in, 561; Aphidiine parasites of aphids in, 603
- Frankliniella*, control of, on cotton in North Carolina, 272; insecticides against, on cotton in Texas, 278; systemic insecticides against, on cotton in Texas, 589; sprays against, on cotton in Texas, 591
- Frankliniella fusca*, infestation of cotton by, in Alabama, 165; effect of sprays against, on yield of groundnuts in Brazil, 376
- Frankliniella occidentalis*, on cotton, onion, lucerne, and lettuce in New Mexico, 43; damage to safflower plants by, in California, insecticides against, 276
- Frankliniella tenuicornis*, measures against, on grasses in Germany, 101
- Frankliniella tritici*, infestation of cotton by, in Alabama, 165
- Fraxinus*, *Saissetia oleae* on, in Greece, 52; *Ennomos fuscantaria* on, in Spain, 255; parasites of *Abraxas pantaria* on, in Portugal, 294; *Hylesinus oleiperda* on, in Sweden, 295
- Fraxinus americana*, *Eulecanium* spp. on, in Ontario, 203
- French Somaliland, *Schistocerca gregaria*, 597
- Friesia*, on grass and white clover in Holland, in relation to injurious fungi, 383
- Fructose, effect of, on pheromone production in *Ips confusus*, 409
- Fruit, pests of, in India, 316; pests and diseases of, in Spain, 569
- Fruits (Dried), treatment of, damaged by insects and mites in Turkey, 614
- Frumin (see Disulfoton)
- Frumin G.6309 (see Disulfoton)
- Fumigants, comparative toxicity of, to *Aonidiella aurantii*, 85; for stored wheat, 238; determination of, by gas chromatography, 240; effect of vapour pressure of, on mortality of stored product insects in vacuum fumigation, 253; against *Trogoderma granarium* in oil-seed cake, 333; against stored product pests, 614
- Fungi, Entomogenous, book on, 3; infesting *Neodiprion pratti pratti*, 34; infecting mites, 49; infecting Lepidoptera, 56; infesting *Diprion pini*, 106; infesting *Melolontha melolontha*, 120; as parasites of insects, 184; control of insects by, 240; on *Empoasca devastans*, in India, 343; review of, attacking insects, 427; isolated from *Hyphantria cunea* and *Leptinotarsa decemlineata*; Entomophthoraceous, new species of, in insects in Poland; Entomophthoraceous, outbreak of, on Syrphids, 428; infesting *Eucosma tedella*, 564
- Fungi, Injurious, relation of insects to, 17, 26, 33; methyl p-hydroxybenzoate against, in insect cultures, 65; associated with *Amphithales episcopopa* injuring *Actinophora fragrans* in Java, 178; *Cryptolestes ferrugineus* and *Oryzaephilus mercator* developing on, 236; control of, in Argentina, 288; *Xyleborus monographus* feeding on, 336; *Tribolium* spp. on, 344; relation of *Thomasinia theobaldi* to, on raspberry, 382; Collembola in relation to, on clover and grass, 383; attractiveness to termites of substances found in wood attacked by, 406; efficacy of wood preservatives against, 407; infesting plants in Northern Rhodesia, 620; relation of insects to, 623; isolated from *Oebalus poecilus* on rice, 638; combined control of spider mites and, 651 (see also Ambrosia Fungus, Mushrooms and Sooty Mould)
- Fungi-Bordo (see Copper Sulphate)
- Fungichromin, effects of, on reproduction of *Myzus persicae*, 496
- Fungicides, not affecting *Panonychus ulmi*, 157; tainting of apples, pears and grapes by, 240; isoboles for graphic representation of synergism in, 382
- Furadroxyl (see 5-Nitro-2-furaldehyde-2-(2-hydroxyethyl)semicarbazone)
- Furniture, *Eupactus solidus* attacking, 389; infested by *Lyctus linearis* in Hungary, 402
- Fusarium, *Ostrinia nubilalis* in relation to infection of maize by, 17; Collembola in relation to, on clovers and grass in Holland, 383; isolated from *Oebalus poecilus* on rice, 638
- Fusarium episphaeria* f. *coccophila*, pathogenicity of, for *Aonidiella aurantii*, 428
- Fusarium moniliforme*, development of stored-product insects on, 237

## G

- G 13010 (see Prothidathion)
- G 24163 (see Chloropropylate)
- G24746 (see Diethyl 2-Thiomethyl-4-methyl-6-pyrimidinyl Phosphate)
- G24747 (see O,O-Diethyl O-2-Thiomethyl-4-methyl-6-pyrimidinyl)
- G-30494 (see O,O-Dimethyl S-2,5-Dichlorophenylthiomethyl Phosphorodithioate)
- D-Galactose, attractive to *Eurytoma roddei*, 57
- Galerucella birmanica*, insecticides against, on *Trapa bispinosa* in India, 440
- Galleria mellonella*, *Bacillus thuringiensis* against, 103; studies on purine excretion in, 116; infected with *Borrelinavirus galleriae*, 120; *Gryllotalpa gryllotalpa* reared on, 124; pathogenicity of different strains of *Bacillus thuringiensis* for, 178; effect of parasitism by *Pimpla turionellae* on adult emergence of, 204; new type of virus disease in, in France, 226; artificial parasitisation of, by *Lydella grisescens*, 293; *Tyrophagus putrescentiae* transmitting *Beauveria bassiana* to, in Czechoslovakia, 345; as food for laboratory reared *Podisus maculiventris* in Quebec, 349; attacking hive bees in Rhodesia, 394; pathogenicity of *Pseudomonas aeruginosa* for; not able to be infected artificially with *Adelina tribolii*, 427; role of intestinal microflora of, on development of bacterial infection in, 428; susceptibility of, to *Bacillus thuringiensis*, 430; virulence of virus increased when passed through successive generations of; development of polyhedrosis virus after oral infection of, 431; used in tests for selection of pathogenic forms of bacteria, 432; *Smithia-virus pectinophorae* sp.n., not transmitted to, 536; commercial preparations of *Bacillus*

- thuringiensis* against larva of, as pest of bee hives, 566; polyphenoloxidase in haemocytes of immunised larvae of, 572; effect of venom of *Bracon hebetor* on respiration of, 620
- Gall-midges, occurrence and bionomics of, in Britain, 569
- Gamatox (see BHC)
- Gammalin (see BHC)
- Ganaspidium pusillae*, insecticides against *Lirio-myza munda* not destroying, in Florida, 208
- Ganaspis carvalhoi*, as synonym of *G. pelleranoi*, 288
- Ganaspis pelleranoi*, *G. carvalhoi* as synonym of; parasitising *Anastrepha fraterculus* in Argentina, parasitising *Lonchaea* and *Anastrepha* spp. in Brazil, 288
- Garlic, bromide residues from methyl bromide fumigations of, 419
- Gas Chromatography, of insecticide residues, 32; use of, in determining sex attractants in *Heliothis*, 45; to determine sex-pheromone activity, 61; of insecticide residues, 113; determination of fumigant gases by, 240; of residual vapours in fumigated stored product insects, 253; selective detection of phosphorus, sulphur and halogen in pesticides by, respiration measurement of *Tribolium confusum* by, 404; of fatty acids in *Hypera variabilis*, 413; for measuring toxaphene in milk, fat, blood, and lucerne hay, 464; of insecticide residues, 485
- Gas-liquid Chromatography of insecticide residues, 280; pyrethrum constituents separated by, 404; determination of DDT and DDE by, in insects, 488; analysis of dimethyl 1-dimethylcarbamoyl-1-propen-2-yl phosphate by, 524
- Gastrimargus immaculatus*, in Réunion, 112
- Gastrolina thoracica*, bionomics and natural enemies of, on *Juglans mandshurica* in Soviet Union, 11
- Gastrophysa cyanea*, comparative preference of, for glanded and glandless cottons in Mississippi, 360
- Gastrophysa polygoni*, as alternative host for *Perilloides bioculatus*, 575
- GC 3707 (see Dimethyl 1,3-Di(methoxycarbonyl)-1-propen-2-yl Phosphate)
- GC 4072 (see Chlorfenvinphos)
- G.C. 9879, in sprays against *Neodiprion taedae linearis*, 643
- GD-7 (see O-Ethyl S-Ethylthioethyl Methylphosphonothioate)
- GD-42 (see O-Ethyl S-(S-methyl-S-ethylthioethyl) Methylphosphonothioate)
- Gebutox-flüssig (see Dinoseb-ammonium)
- Gebutox Oil (see Dinoseb-ammonium)
- Geby 12968 (see Lythidathion)
- Gelis*, parasitising *Diprion pini*, 106; bionomics of, parasitising *Bathyplectes curculionis* in Delaware and Jersey, 369
- Genisten, attractive to *Eurytoma roddi*, 57
- Geococcus coffeae*, infesting roots of *Citrus* and ornamental plants in Florida, 543
- Geocoris*, preying on *Heliothis zea*, 582; as predator of *Lygus hesperus*; parasitism of, in Californian, 583
- Geocoris jucundus*, predacious on *Empoasca devastans* in India, 86
- Geocoris punctipes*, predacious on eggs of *Heliothis zea* in Arkansas, 416
- Geocoris tricolor*, predacious on *Empoasca devastans* in India, 86
- Geocoris uliginosus*, predacious on eggs of *Heliothis zea* in Arkansas, 416
- Geioica utricularia*, not transmitting barley yellow-dwarf virus in South Dakota, 292
- Geol (see DNC)
- Geometrid, attacking *Hakea gibbosa* in New South Wales, 314
- Georgia, bees pollinating groundnuts in, 45; aphids on cereals in, 46; *Elasmopalpus lignosellus* attacking grass and legumes in, 169; *Elasmopalpus lignosellus* in, 206; *Euzophera magnolialis* sp.n. attacking magnolia in, 210; insecticide residues on forage crops in, 273; *Heliothis* spp. on cotton in, 276; pests of maize in, 280; control of Noctuids on sweet maize in, 361; stored-product insects in wheat in, 364; *Rhynacrus breittlowi* and other Eriophyids on *Magnolia grandiflora* in, 414; plant density in relation to arthropods on *Avena sativa* in, 487; *Dalbulus maidis* on maize in, 500; *Heliothis* spp. on *Geranium carolinianum* in, 539; *Stictiocephala militaris* infesting *Liquidambar styraciflua* in, 540; *Elasmopalpus lignosellus* on soy bean and cowpea in, 579; *Sathrobrotia rileyi* and other pests of maize in, 588; *Trichogramma minutum* parasitising *Rhyacionia* spp. on pine in, 590
- Geraniol, *Drosophila melanogaster* not responding to, 289; in baits for insects, 399
- Geranium carolinianum*, as early-season food-plant of *Heliothis* spp. in U.S.A., 539
- Germany, *Hyponomeuta padellus* on *Prunus spinosa* in, *Cecidophyopsis ribis* on black currant in, *Dasyneura tetensi* on black currant in, 54; *Oligonychus ununguis* on spruce in, 59; pests of *Populus nigra* in, 60; Lachnids on spruce in, pests of pine in, 99; *Haplodiplosis equestris* on cereals in, 100; Thysanoptera on grasses in, 101; *Quadraspidiotus perniciosus* on apple in, 102; predators of *Panonychus ulmi* on plum in, 121, 122; *Panonychus ulmi* and predacious mites on plum in, 122; value of bird protection in oak forest in, insecticide resistant strains of *Drosophila melanogaster* in, 126; *Nemapogon cloacellus* damaging corks of wine bottles in, aphid and beetle species on pine in, 237; *Hyadaphis tataricae* infesting *Loniceria tatarica* in, chronological table of plant protection in, use of aircraft in plant protection in, 239; *Hylemya coarctata* on cereals in, 294; *Anarsia lineatella* and *Cydia molesta* in, 333; *Xyleborus monographus* on oak in, 336; *Tarsonemus muehleii* on grasses in, insect pests of apple, vines, and *Prunus* in, 337; viruses transmitted by *Myzus persicae* and *Aphis fabae* on beet in, 338; *Ceutorhynchus pleurostigma*, *Phytomyza rufipes* and *Psylliodes chrysocephalus* on rape in, *Neodiprion sertifer* on pine in, *Panorpa communis* in, 339; *Leptinotarsa decemlineata* in, 340; mass rearing of aphids in, 341; *Diprion pini* on pine in,



- 378; *Choristoneura murinana* on *Abies alba* in, Tetranychid mites in, 379; *Haplodiplosis equestris* on cereals and grasses in, 380; virus transmission by *Macrosiphum* spp. in, 381; *Rhynchaenus fagi* damaging orchard fruits in, *Camponotus* ants on forest trees in, treatment of timber against attack by timber beetles in, 456; effects of  $\gamma$  BHC on soil microfauna in, 517; flight and egg maturation of *Melolontha* spp. in, residues of organophosphorus insecticides on lettuce under glass in, mites on flowers and ornamental plants in, 518; control of *Quadraspidiotus perniciosus* on fruit trees in, 519; *Aegeria tipuliformis* on black currant in, 520; *Syrphus luniger* reared on *Aphis fabae* in; pests of textiles in, 521; effects of forest soil fertilization on infestation by *Rhyacionia buoliana* in, 522; effects of sulphur preparations on Tetranychids in, 522; *Diprion pini* on pine in, 562; *Choristoneura murinana* on fir in, *Xylosandrus germanus* attacking oak in, 563; natural enemies of *Eucosma tedella* on spruce in, woodlice invading houses in, *Aphis fabae* on beet in, 564; oviposition by *Hylemya coarctata* in relation to crop rotation in, food-plant range and flight ability of *Haplodiplosis equestris* in, insecticide resistance in *Drosophila melanogaster* in, 565; parasites of *Pristiphora abietina* on spruce in, 566; introduced and established stored-product pests in, 571; factors affecting insect pests on trees in, 576; effect of control measures against rape pests on their parasites in, 618; *Formica* spp. in, *Panolis flammea* on pine in, 655; *Ephialtes punctulatus* entering farm buildings in, 657; *Rhynchaenus fagi* in, 658; *Hylotrupes bajulus* infesting buildings in, 658; *Trichogramma embryophagum* parasitising *Panolis flammea* in, 659; use of *Misocyclops pini* against *Thecodiplosis brachynera* on pine in, 659
- Gesarol (see DDT)
- Gesarol 50 paste (see DDT)
- gestroi, *Diadipsa*
- Ghana, *Distantiella theobroma* on cacao in, 72; survey of data on agricultural insects in, 114; rosette disease of groundnut in, 133; *Distantiella theobroma* and *Sahlbergella singularis* on cacao in, 333; control of termites in buildings in, 334; *Acanthopsyche tristoides* sp.n. on cacao in, 403; dimethoate in cacao trees in, 532; Lepidoptera associated with cocoa in, 620; *Calidea dregii* on *Jatropha podagrica* in, 645
- Gibberellic Acid, protecting oil-sprayed oranges from water spot, 491
- Gibbium psylloides*, infesting processed food bari in storage in India, 399; records of, infesting textiles in Germany, 521, 522
- Gilpinia hercyniae*, infesting spruce in Soviet Union, 140
- Gilpinia polytoma*, infesting spruce in Soviet Union, 140
- Glacial Acetic Acid, vapour of, causing mortality of *Drosophila melanogaster*, 289
- Glasshouses, integrated control programmes in, in Britain, 507
- Glaurocara flava*, parasitising *Homorocoryphus nitidulus vicinus* in Tanganyika, 476
- (L 4760)
- Gleditsia triacanthos*, in Florida, 543-545
- Gliricidia sepium*, *Aphis craccivora* on, migrating to groundnuts in Uganda, 133
- Glucocapparin, stimulating feeding by *Pieris brassicae*, 599
- Glucose, attractiveness of, to *Anthonomus grandis*, 281; effect of, on reproduction of *Tetranychus telarius*, 353; effect of, on pheromone production in *Ips confusus*, 409; in diet for *Anthrenus flavipes*, 441
- Glucotropaeolin, stimulating feeding by *Pieris brassicae*, 599
- L-Glutamic Acid, inducing feeding response in *Choristoneura fumiferana* on *Picea glauca*, 158
- DL-Glutamine, attractiveness of, to *Eurytoma roddi*, 57
- Glutathione, in diet for *Tribolium* spp., 503
- Glycerol, and cold-hardiness in Lepidoptera, 423
- Glycine, in diet for *Ips calligraphus*, 209
- Glycogen, effect of, on *Anthonomus grandis*, 116
- Glyciphagus destructor*, use of *Cheyletus eruditus* against, in stored grain in Czechoslovakia, 200
- Glyodin, with azinphos-methyl against *Cydia pomonella*, 448
- Glypta bipunctoria*, parasitising *Tortrix viridana*, 426
- Gnathocerus cornutus*, effect of  $\gamma$ -radiation on, 58; effect of temperature on, in flour mills in Britain, 77; effects of  $\gamma$ -radiation on, in Hungary, 324
- Gnathotrichus retusus*, mycangia in, 310
- Gnathotrichus sulcatus*, mycangia in, 310
- Goat, DDT residues in, in U.S.A., 641
- Goldfish (see *Carassius auratus*)
- Gomphrena globosa*, infected by virus disease of artichokes, 107
- Gonia*, parasitising *Spodoptera mauritia* in Philippines, 481
- Goniozus triangulifer*, released against *Nacoleia octasema* on banana in Fiji, 177
- Gonocephalum*, on maize in Rhodesia, 72
- Gooseberry, *Archips rosanus* on, in Poland, 9; *Archips rosanus* on, in Soviet Union, 191; disappearance of malathion residues from, 240; insects found in abandoned feeding sites of Tortricids on, in Poland, 603; *Aphis tri-glochinis* in relation to, in Britain and Holland, 653
- Gossyparia spuria*, systemic insecticides against, on *Ulmus americana* in Virginia, 286
- Gossypium* (see also Cotton)
- Gossypium anomalum*, susceptibility of, to *Spodoptera littoralis* in Egypt, 258
- Gossypium barbadense*, varietal susceptibility of, to *Empoasca lybica* and *Bemisia tabaci*, 475
- Gossypol, effect of, on *Heliothis* spp., 280; Alcoholic, attractiveness of, to *Anthonomus grandis*, 281
- Gourd, as rearing medium for *Dacus* spp., 218
- Grain (Stored), pests of, in India, 316; pests of, in U.S.A., 343
- Gram (see *Cicer arietinum*)
- Gram, Red (see *Cajanus cajan*)
- Gramineae, as food plants for *Lema melanopa* in Indiana, 307

- Graminella nigrifrons*, transmission of maize stunt virus by, in U.S.A., 644
- Grapefruit, *Aonidiella aurantii* and *Panonychus citri* on, 32; *Toxoptera citricida* in relation to viruses of *Citrus tristeza* complex of, 60; Coccids on, in Florida, 208; *Anastrepha suspensa* on, in Florida, 211; *Eurytoma fellis* on, in New South Wales and Queensland, 314; *Saissetia oleae* on, in Israel, 400; *Ollarianus strictus* and *Lymaenon marylandicus* reared from, in Texas, 648
- Graphognathus *leucoloma fecundus*, on rice and *Lolium* in the U.S.A., soil treatments against, 32
- Graptosoma *italicum*, *Asolcus semistriatus* parasitising eggs of, in Soviet Union, 189
- Graptophyllum, sprays not affecting, 263
- Grass, Bermuda (see *Cynodon dactylon*)
- Grass, Couch- (see *Agropyrum repens*)
- Grass, Johnson (see *Sorghum halepense*)
- Grass, Kikuyu (see *Pennisetum clandestinum*)
- Grass, Pangola (see *Digitaria decumbens*)
- Grasses, new Aleyrodid on, in U.S.A., 62; Eriophyids on, in Rhodesia, 71; Thysanoptera on, in Britain, 79; *Haplodiplosis equestris* on, in Germany, 100; Thysanoptera on, in Germany, 101; cultural practices in relation to infestation of, 102; in relation to infestation of wheat by *Hylemya coarctata*, 105; *Melolontha melolontha* on, in France, 120; apple aphids migrating to, 121; *Lissonotus oryzophilus* on, in California, 161; *Elasmopalpus lignosellus* on, in Georgia, 169; *Oebalus poecilus* on, migrating to cotton in British Guiana, *Rupela albinella* on, in British Guiana, 171; *Agriphila straminea* on, attacking lucerne and cereals in Britain, 231; aerial density of *Oscinella frit* over, in Britain, 233; *Tarsonemus muellei* sp.n. on, in Germany, 337; thrips on, in Holland, 341; relative attractiveness of, to *Haplodiplosis equestris* in Germany, 380; Collembola in relation to injurious fungi on, in Holland, 383; *Chilo suppressalis* on, in Asia, 481, 482; *Oncopera* spp. on, in Queensland, 484; thrips on, in Illinois, 497; *Haplodiplosis equestris* on, in Germany, 565; as hosts of barley yellow-dwarf virus in Czechoslovakia, 631
- Grasshoppers, measures against, in India, 85; in Tanganyika, 112; parasitised by *Mermis subnigrescens* in Quebec, 157; anatomy, physiology, development, phase polymorphism, and taxonomy of, 184; identification of, through their faecal pellets, in India, 295; metal cage for rearing of, 296; parasitised by *Tephromyiella neuquenensis* in Argentina and Chile, 409; chromogen ratio for determining digestibility for, 524; in Britain, food habits of, in sandhills prairie in North Dakota, mandibles, feeding behaviour and injuriousness of, 571; toxicity of concentrated sprays to, 593; radar in desert survey and control of, 597; method for estimating populations of, in Uruguay, 640
- Greece, *Saissetia oleae* on ash, *Crataegus*, *Lotus corniculatus*, olive and *Pistacia terebinthus* in, 52; insecticide resistant strains of *Drosophila melanogaster* in, 126; effects of  $\gamma$ -radiation on *Dacus oleae* in, 284; *Anarsia lineatella* and *Cydia molesta* in, 333; *Dacus oleae* on olives in, 411; sterilization of *Dacus oleae* on olives in, 578
- Gronops *inaequalis*, damaging beet in Soviet Union, 194
- Ground Beetles, preying on *Ostrinia nubilalis* on maize in U.S.A., 275
- Groundnut Meal, in baits for *Pogonomyrmex occidentalis*, 486
- Groundnut Oil, in diet for *Ips calligraphus*, 209
- Groundnuts, pollination of, by bees in Georgia, 45; pests of, in Rhodesia, 74; *Lachnosterna* on, in India, 85; graft, aphid and mechanical transmission of virus causing rosette disease of, in Ghana, 133; varietal resistance in, to rosette disease transmitted by *Aphis craccivora* in Nyasaland, 134; protection of, from insect pests in India, insect pests of, in India, 216; *Cyrtomenus mirabilis* on, in Brazil, 241; effect of nutrition of, on *Aphis craccivora*, 260; fat content in relation to insecticide contamination of, 281; effects of different levels of nitrogen, phosphorus and potassium in, on fecundity of *Aphis craccivora* in India, 317; pests of, in India, 318; effect of sprays against *Frankliniella fusca* on yield of, in Brazil, 376; pests of, in Somalia, 380; *Stomopteryx subsecivella* on, in China, 483; *Trichoplusia ni* and *Pseudoplusia includens* on, in Alabama, 498; in diet for *Corcyra cephalonica*, 558
- Groundnuts (Stored), no breeding of *Sitophilus granarius* in, 5; insects infesting, in Nigeria, 110; pests of, 463
- Groundsel (see *Senecio vulgaris*)
- Grylloides *sigillatus*, fatty acids inhibiting growth of, 605
- Gryllotalpa, on rice in Iran, 519
- Gryllotalpa *gryllotalpa*, effect of animal food on increase of, 124; penetration and metabolism of endothion in, 228
- GS 12968 (see Lythidathion)
- GS 13005 (see Methidathion)
- Guadeloupe, *Lachnosterna placei* attacking banana in, 560
- Guatemala, *Ips* spp. in, 205; mites of subfamily Phytoseiinae in, 211; *Bemisia tabaci* on cotton and other plants in, 401; control of *Leucoptera coffeella* on coffee in, 578
- Guava, *Ceratitidis rosa* and *C. capitata* on, in South Africa, 129; *Dacus* spp. on, in India, 214, 218; fruit-flies on, in Brazil, 241;  $\gamma$ -radiation as quarantine treatment of, 284; pests of, in Somalia, 380; *Ceratitidis capitata* on, in Israel, 613
- Guiana British (see Guyana)
- Guiana, Dutch, *Termitaphylidea opaca* preying on *Selenothrips rubrocinctus* on cacao in, 171
- Guinea Pig, metabolism of carbaryl in, 404; nuclear-polyhedrosis virus of *Trichoplusia ni* found harmless to, 536
- Gusathion (see Azinphos-methyl)
- Gusathion A (see Azinphos-ethyl)
- Guthion (see Azinphos-methyl)
- Guyana, pests and diseases of rice in, 171; pests and diseases of *Digitaria decumbens* in, *Oebalus poecilus* on rice in, 638
- Gymnaspis *aechmeae*, new records of, on ornamental plants in Bulgaria, 557



*Gymnoscelis pumilata*, bionomics, foodplants, parasites and control of, in Sicily, 608  
*Gynaikothrips ficorum*, *Adactylidium* sp., predacious on eggs of, on *Ficus nitida* in Egypt, 538  
 Gyplure (see *d*-12-Acetoxy-*cis*-9-octadecen-1-ol)

## H

HA-3, against *Lymantria dispar*, 389  
*Habrocytus*, parasitic in *Cydia toreuta*, 596  
*Habrocytus lixi*, *Lixus algerus* parasitised by, in Sicily, 606  
*Habrocytus thyridopterigis*, parasitising *Itopectis conquisitor* in Virginia, 29  
*Habrolepis dalmanni*, *Habrolepis fanari* sp.n., confused with, 462  
*Habrolepis fanari* sp.n., parasitising *Chrysomphalus ficus* in North Africa and Middle East, 462  
*Habrolepis pascuorum*, *Habrolepis fanari* sp.n., confused with, 462  
*Hadena sordida*, varietal resistance of wheat to, in Soviet Union, 293; infection of, with two viruses, 431  
*Hadrobregmus nitidus*, attacking deciduous trees in Poland, 324  
*Haemolytis*, *Agonoxena miniana* described in, 445  
*haemorrhoidalis*, *Syngamia*  
 Haiti, *Aleurocanthus woglumi* in, 172  
*Hakea*, insects attacking, in New South Wales, 314  
*Hakea gibbosa*, in New Zealand and South Africa, insects attacking, in New South Wales, 314  
*Hakea sericea*, in New Zealand and South Africa, insects attacking in New South Wales, 314  
*Hakea suaveolens*, in South Africa, 314  
*Halictophagus chilensis* sp.n., parasitising *Deltocephalus glaucus* in Chile, 378  
 Halogen, detection of, in pesticides by microcoulometric gas chromatography, identification of, in pesticides by mass spectroscopy, 404  
*Halogeton glomeratus*, doubtful survival of *Heterographis fulvobasella* on, 165  
*Halogeton sativus*, *Heterographis fulvobasella* on, in Morocco and Spain, 164  
*Haltica tombacina*, defoliating fireweed in British Columbia, 423  
*Halticoptera fuscicornis*, attacking *Oscinella frit* in Britain, 467  
*Halyomorpha picus*, bionomics, food-plants, and control of, in Japan, 546  
*Hapleginella laevifrons*, bionomics of, on pine in Soviet Union, insects associated with, on pine in Soviet Union, 193  
*Haplodiplosis equestris*, bionomics, population dynamics and natural enemies of, 100; relative attractiveness of cereals and grasses to, in Germany, 380; food-plant range and flight ability of, in Germany, 565  
*Haplothrips aculeatus*, measures against, on grasses in Germany, 101; bionomics of, attacking cereal crops in Holland, 341

*Hardya anatolica*, bionomics, parasitism and control of, on wheat in Yugoslavia, 136  
*Harmonia axyridis*, predacious on *Gastrolina thoracica* in Soviet Union, 11  
*Harmonia quadripunctata*, natural enemies of, 104  
*Harpalus compar*, dispersal of, on soil surface in Ontario, 201  
*Harpalus erraticus*, dispersal of, on soil surface in Ontario, 201  
*Harpalus pennsylvanicus*, dispersal of, on soil surface in Ontario, 201  
*Harpalus rufipes*, on cereals in Soviet Union, 17  
*Hartigia nigra*, parasitised by *Ephialtes detritus* in Holland, on cultivated blackberries in Holland, 382  
 Hawaii, quarantine measure for control of *Dacus dorsalis* and *Ceratitis capitata* in, 170; *Sternochetus mangiferae* on mangos in, 173; introduction of parasites against *Nezara viridula smaragdula* in, 173; *Adoretus sinicus* in, introduced enemies of *Achatina fulica* in, introduction of natural enemies of *Myrica* spp. in, 174; host range of *Bactra triculenta* and *Athesapeuta cyperi* introduced against nutgrass in, microsporidiosis in *Pseudaletia unipuncta* in, 175;  $\gamma$ -radiation as quarantine treatment against Trypetids infesting fruits in, 284; cytoplasmic-polyhedrosis virus in *Pseudaletia unipuncta* in, 373; transmission of papaya mosaic virus by *Myzus persicae* in, 495; soil insecticides for control of subterranean termites in, 587  
 Hawthorn (see *Crataegus*)  
 HCH (see BHC)  
 Heat, treatment of stored products with, against insect and mites, 614  
*Hecabolus*, *Rupela albinella* parasitised by, in British Guiana, 172  
*Hedya nubiferana*, parasitism of, on apple in Italy, 330; comparative spray tests with *Bacillus thuringiensis* against, on apple in Germany, 337; on apple in Poland, 453  
*Helianthus annuus*, *Encarsia lutea* parasitising *Trialeurodes* spp. on, in Arizona, 168; *Melanogryllus desertus* on, in France, 227; damaged by *Actinote pelleneae pelleneae* in Argentina, 287; *Homoeosoma nebulella* on, in China, 463; persistence of methyl-parathion residues on seeds of, 464; insects attacking stored seeds of, in Yugoslavia, 602  
*Heliconia*, *Nacoleia octasema* on, 177; *Bemisia tabaci* associated with sooty mould on, in Central America, 401  
 Helicopter (see Aircraft)  
*Heliethis*, modified Malaise trap for, in crop fields in Arizona, 596  
*Heliethis armigera*, control of, on cotton in Kenya, 134; effectiveness of sprays against, on cotton, 334; aerial sprays against, attacking beans in Tanganyika, 394; diapause of, in relation to temperature in Soviet Union, 434; chemical control of, on cotton in Uganda, 442; comparison of aerial and ground sprays against, on cotton in Rhodesia, 474; on cotton in Iran, 519; aerial control of, on beans in Tanganyika, 530; DDT applied by hand-operated spraying machines against, on

- cotton in Uganda, 625; decline in importance of, as cotton pests in the Sudan, 656
- Heliothis assulta*, infected by *Borrelnavirus* sp., 439
- Heliothis peltigera*, damaging *Carthamus tinctorius* in Israel, 636
- Heliothis virescens*, *Cardiochiles nigriceps* parasite of, light-trap catches of, on cotton in Texas, 30; on sesame in Texas, 42; sex attractants of, 45; effects of female sex pheromones on, 61; insecticides against, on cotton in Alabama, 165; insecticide application schedules against, on cotton in Alabama, 166; seasonal occurrence of, on cotton in Louisiana, 168; on cotton in Texas, 169; insecticides against, on cotton in Colombia, 211; control of, on cotton in North Carolina, 272; seasonal abundance of, on cotton in Georgia, 276; cotton pigments as source of resistance to, 280; studies on diapause of, in Louisiana, 306; resistance of, to insecticides, on cotton in Texas, 369; survival of, on tobacco and wheat-germ diet in Kentucky, 413; penetration and metabolism of  $^{14}\text{C}$  labelled DDT in resistant and susceptible strains of, in Mississippi, 491; in okra pods in Texas, 499; metabolism of dimethyl 1-methylcarbamoyl-1-propen-2-yl phosphate by, 507; *Smithiavirus pectinophorae* sp.n., transmitted to, 536; *Geranium carolinianum* and *Linaria canadensis* as early-season food-plants of, and Hymenoptera parasitic in, in U.S.A., feeding responses of, to plant extracts, 539; infestation of glanded and glandless cotton by, in Texas, host specificity of *Cardiochiles nigriceps* in, on tobacco in Mississippi, 581
- Heliothis zea*, artificial diet for, 23, 29; oviposition of *Cardiochiles nigriceps* on, on cotton in Texas, light-trap catches of, 30; on sesame in Texas, 42; sex attractants of, insecticides against, on cotton in South Carolina, traps for, 45; test for determining activity of the nuclear-polyhedrosis virus in, 49; infra-red theory of communication in, histology of ommatidium of, 64; insecticides against, on cotton in Alabama, 165; insecticide application schedules against, on cotton in Alabama, 166; *Encarsia lutea* parasitising eggs of, on cotton in Arizona, seasonal occurrence of, on cotton in Louisiana, 168; on cotton in Texas, 169; artificial diets for rearing of, for insecticide tests, 170; malathion sprays not effective against, on cotton in Arizona, 171; insecticides against, on cotton in Colombia, 211; on cotton in North Carolina, control of, on cotton in North Carolina, 272; control of, on forage crops, 273; seasonal abundance of, on cotton in Georgia, 276; insecticides against, on maize in Georgia, 280; cotton pigments as source of resistance to, 280; studies on diapause of, in Louisiana, 306; effects of, on cotton quality in Texas, insecticides against, 355; comparative preference of, for glanded and glandless cottons in Mississippi, 360; DDT against, nuclear-polyhedrosis viruses in control of, on sweet maize in Georgia, 361; resistance of experimental cotton strain 1514 to, in Texas and Mississippi, 362; resistance to DDT in, on crops, investigation of existence of food-plant specificity in strains of, in Louisiana, tests of dusts for control of, on lettuce in Texas, 367; resistance of, to insecticides, on cotton in Texas, 369; survival of, on tobacco and wheat-germ diet in Kentucky, 413; destruction of eggs of, on cotton by predators in Arkansas, 416; *Spanogonicus albofasciatus* predacious on, on cotton in Arizona, 417; evaluation of insecticides against, on sweet maize in Kansas, 486; factors affecting resistance of maize to, in California, 488; in okra pods in Texas, 499; metabolism of dimethyl 1-methylcarbamoyl-1-propen-2-yl phosphate by, 507; devices to facilitate rearing of, 524; *Smithiavirus pectinophorae* sp.n., transmitted to, 536; feeding stimulant combined with nuclear-polyhedrosis virus against, on cotton, 537; *Geranium carolinianum* and *Linaria canadensis* as early-season food-plants of, and Hymenoptera parasitic in, in U.S.A., feeding responses of, to plant extracts, 539; parasitised by *Neoaeplectana* DD-136 (nematode), 541; infestation of glanded and glandless cotton by, in Texas, failure of *Cardiochiles nigriceps* to develop in, 581; natural enemies and infestation rates of, on maize in California, 582; *Sathrobrotia rileyi* in relation to, on maize in U.S.A., 588; photo-electric counter to monitor olfactory responses of, 594; use of plant parts as food by, 649
- Helisoma trivolvis*, toxicity of insecticide to, 160
- Helminthosporium oryzae*, isolated from *Oebalus poecilus* on rice, 638
- Helodoty foveolatus*, infestation and control of, on rice in British Guiana, 172
- Helomyia lateralis*, reared from *Eurygaster integriceps* and other insects in Soviet Union, 549
- Helopeltis*, not found on cacao in Nigeria, 626
- Helopeltis theivora*, comparison of insecticides against, on tea in India, 397
- Hemerocampa pseudotsugata*, virus diseases of, 18; effects of temperature on, and activity rhythms of, in British Columbia, 423; rearing larvae of, on synthetic media in California, 496
- Hemiberlesia lataniae*, new records of, on ornamental plants in Bulgaria, 557
- Hemiberlesia rapax*, unidentified Aphelinid parasite reared from; new records of, on ornamental plants in Bulgaria, 557
- Hemichroa crocea*, bionomics and parasitism of, on *Alnus viridis* in Austria, 456
- Hemiptera, predacious species of, in Poland, 603
- Hemisphaerota cyanea*, on palms in Florida, 543
- Hemitarsonemus latus*, chemical control of, on cotton in Uganda, 442; on flowers and ornamental plants in Germany, 518; DDT applied by hand-operated spraying machines against, on cotton in Uganda, 625; infesting tea in India, 663
- Hemiteles*, as hyperparasite of *Rhyacionia buoliana*, 90
- Hemlock, Western (see *Tsuga heterophylla*)
- Hemp, Sunn (see *Crotalaria juncea*)



- Hemp, *Ostrinia nubilalis* on, in Soviet Union, 17
- Hempa (see Hexamethylphosphoramide)
- Heptaliscus sordida*, in Java, 177
- Heptachlor, soil treatments with, against *Graphognathus leucoloma*, 32; against *Hypera variabilis*, 36; against *Sitona cylindricollis*, 40; residues of, in soil, 45; toxicity of, to *Spodoptera littoralis*, 84; toxicity of, to *Coccinella septempunctata*, against aphids, 85; seed treatment with, 105; soil and seed treatments with, in dusts against rice pests, 141; resistance to, in *Hylemya brassicae*, 154; toxicity of, to cyclodiene-susceptible and cyclodiene-resistant strains of *Hylemya antiqua*, 163; effectiveness of, against *Costelytra zealandica*, 176; effect of, on *Cleonus punctiventris*, 195; against *Elasmopalpus lignosellus*, 206; and chlordane, soil treatment with in granules against *Scapteriscus aetetus*, 207; side effects of treatments with, against *Solenopsis saevissima richteri*, 209; against corn borers, 221; against *Heteronychus arator*, in sprays against *Spodoptera litura*, 222; soil treatment with, in dusts against *Cyrtomenus mirabilis*, 242; topical and soil applications of, against *Eleodes suturalis*, 270; residues of, in crop seeds, soil treatment with, against *Popillia japonica*, 281; in seed-dressings against *Hylemya coarctata*, 294; toxicity of, to adults and larvae of *Dacus cucurbitae*, 316; in granules, against *Sitona* spp., 321; in dusts, soil treatment with, against Tipulid larvae, 329; in dusts, soil treatment with, against *Chrysomela americana*, 331; *Drosophila melanogaster* used in tests for, persistence and degradation of, in soil, 359; mechanisms of contamination of lucerne with, 360; in granules and soil treatment with, against *Conoderus* sp. and *Lachnosterna cribrosa*, 364; effects of soil types on, against *Trinervitermes trinervoides*, 395; residues of, in lucerne plants and soil following treatment against *Hypera variabilis*, 419; against *Hylemya floralis*, 420; in granules against resistant strains of *Hylemya brassicae*, resistance to, in *Psila rosae*, 421; alone and with BHC, applied in sprays, granules and soil treatment, tolerance of larvae of *Nemoctes incomptus* and *Sciopithes obscurus* to, 422; effects of, on maize yields, in sprays and granules against maize borers, 472; in dusts, against termites and *Chilo infuscatellus*, 479; resistance to, in *Diabrotica longicornis*, 486; susceptibility or resistance to, in *Diabrotica longicornis*, 491; repopulation of thrips in areas previously treated with, against *Popillia japonica*, against *Hypera variabilis*, 497; alone and with Thiram, seed treatments with, in dusts against *Sitona* spp., 550; soil treatment with, against *Hylemya* spp., and effect of, on cabbage, in dusts against *Apion* and *Sitona*, 552; soil treatment with, against *Strategus aloeus*, against *Blaniulus guttulatus*, 577; against *Hypera variabilis*, 580; persistence of, in soil for control of subterranean termites; bioassay of, using *Coptotermes formosanus*, 587; susceptibility of *Limnius dubitans* to, 594; in sprays against *Tropinota squalida* and *Epicometis hirta*, 610
- Heptachlor Epoxide, persistence of, in soil, 45; effects of humidity on persistence of, 47; topical and soil applications of, against *Eleodes suturalis*, 270; presence and persistence of residues of, on forage crops, 276; residues of, in crop seeds, 281; *Drosophila melanogaster* used in tests for, persistence and degradation of, in soil, 359; mechanisms of contamination of lucerne with, 360; residues of, in birds, 400; residues of, in lucerne plants and soil following treatment against *Hypera variabilis*, 419
- Heptachlorohexahydroketomethanophthalan, against *Hypera variabilis*, 36, 580
- Heracleum lanatum*, *Euleia fratria* on, in California, 159
- Herbicides, effects of, on soil fauna, 75; research in, 248; isoboles for graphic representation of synergism in, 382
- Hercules 5727 (see M-Isopropylphenyl Methylcarbamate)
- Hermal L (mixture of  $\gamma$  BHC and thiram), seed treatment with, against *Atomaria linearis*, 516
- Herpestomus brunnicornis*, parasitising *Hypomeumta padellus malinellus* in Yugoslavia, 392
- Herpsciscus sommeri*, on maize in Rhodesia, factors affecting populations of, DDT against, other measures against, 72
- Hesperetin, attractive to *Eurytoma roddi*, 57
- Heterarthrus ochropodus*, bionomics of, on poplar in Italy, control measures for, climatic factors affecting development of, predators and parasites of, 331
- Heterographis fulvobasella*, bionomics, parasitism and host specificity of, 164
- Heteroligus appius*, distribution, bionomics and control of, on yams in Nigeria, 570
- Heteroligus meles*, distribution, bionomics and control of, on yams in Nigeria, 570
- Heteronychus arator*, control of, in market gardens in Western Australia, 222; *Metarrhizium anisopliae* isolated from, in New Zealand, 313
- Heteropelma calcar*, effect of insecticide dusts on parasitism by, in *Bupalus piniarius* in Soviet Union, 190
- Heteroptera, predacious on *Musgraveia sulci-ventris* in New South Wales and Queensland, 314; survey of, on cereals and grains in Sweden, 345; predacious species of, in Poland, 603
- Heterotermes indicola*, in tests of toxicity of insecticides, 86; toxicity of synthetic contact insecticides to, damaging timber in India, 216; attractiveness to, of substances found in fungus-attacked wood, chemical decomposition of wood by, 406; laboratory tests on wood and wood preservatives with, 407; effectiveness of contact insecticides in stored pine sapwood against, 408
- HETP, toxicity of, to *Sitophilus oryzae*, 261
- Hevea brasiliensis*, survey of data on pests of, in Malaya, 118; insect pests of, in Territory of Papua and New Guinea, 480
- Hexachlorobutadiene, as soil fumigant against *Phylloxera vitifoliae*, 634

- 6,7,8,9,10,10 - Hexachloro - 1,5,5a,6,9,9a - hexahydro - 3 - methyl - 6, 9 - methano - 2, 4 - benzo-dioxepin, ineffective in baits for *Pogonomyrmex occidentalis*, 486
- Hexachlorophene (see 2,2'-Methylenebis(3,4,6-trichlorophenol))
- 4,5,6,7,8,8 - Hexachloro - 3a,4,7,7a - tetrahydro-4,7-methanoiden-1-ol, as constituent of technical heptachlor, 32
- Hexamethylphosphoramide, as chemosterilant for *Anthonomus grandis*, 594
- Hexane, as solvent for sex attractant of *Pectinophora gossypiella*, 500
- N-Hexane, used in extractions of rice bran, 548
- Hibiscus dongolensis*, *Pectinophora gossypiella* on, in Rhodesia, 475
- Hibiscus esculentus*, *Empoasca devastans* on, in India, 86; insecticide residues on, against *Earias fabia* in India, 260; *Pectinophora gossypiella* and *Heliothis* spp. in packed pods of, in Texas, 499; transmission of tomato virus disease to, 505
- Hibiscus syriacus*, effect of feeding deterrent in, on *Anthonomus grandis*, 40; as alternate food-plant of *Anthonomus grandis* in Mississippi, 539
- Hibiscus trionum*, *Earias huegeli* on, in Queensland, 450
- Hickory (see *Carya*)
- Hippodamia convergens*, preying on *Ostrinia nubilalis* on maize in U.S.A., 275
- Hippodamia parenthesis*, preying on *Ostrinia nubilalis* on maize in U.S.A., 275
- Hippodamia tredecimpunctata*, preying on *Ostrinia nubilalis* on maize in U.S.A., 275
- Hippodamia tredecimpunctata tibialis*, in herbicide-treated oat fields in New Brunswick, 424
- L-Histidine, attractive to *Eurytoma roddei*, 57
- Hockeria brachygaster*, parasitising larvae of *Casamia innotata* in Libya, 51
- Hockeria unicolor*, *Gymnoscelis pumilata* parasitised by, 608
- HOE 2813, toxicity of, to *Psylla pyricola*, 643
- Hoechst 2802, spore preparation of *Bacillus thuringiensis*, 563
- Hoechst 2813 (see Monofluor Acetyl Phenyl Urea)
- Hoechst Biospor Spritzpulver 2802, against insect pests of apple, vines and *Prunus*, 337
- Hofmannophila pseudospretella*, damaging man-made products, 289; records of, infesting textiles in Germany, 521; wool digestion by larvae of, 522
- Holcocera*, larvae of, as scavengers in pine cones in Arkansas, 303
- Holland, aphids on apple in, interrelations between apple aphids and their parasites and hyperparasites in, distribution of *Typhlodromus pyri* and *Panonychus ulmi* on apple in, pests of apple in, 121; population of *Panonychus ulmi* and *Typhlodromus pyri* on apple in, integrated control measures for apple and pear pests in, 122; *Phloeosinus thujae* and *Phytobia* sp. damaging forest trees in, 178; genetic affinities between adjacent populations of *Tetranychus telarius* in, 236; *Bupalus piniarius* on *Pinus sylvestris* in, 297; *Anarsia lineatella* in, 333; thrips attacking cereal crops in, 341; *Thomasiniana theobaldi* and stem disease of raspberry in, *Hartigia nigra* on cultivated blackberry in, 382; *Collembola* and mortality of grass and white clover in, 383; *Thrips tabaci* on hyacinth bulbs in, *Lithocolletis corylifoliella* on fruit trees and hawthorn in, *Cnephasia longana* in, witches'-broom viruses in, 568; *Bembidion* spp., as predators of *Hylemya brassicae* in, 576; *Panonychus ulmi* on apple in, and *Tetranychus telarius* on roses in, 652; control measures against *Tetranychus telarius* and mildew on cucumber in, 652; *Aphis triglochis* in, *Cydia pomonella* on apple in, 653; *Adoxophyes orana* in, 654; hybrids of *Tetranychus* spp. in, 658
- Holocremnus* sp., parasitising larvae of *Heterarthrus ochropodus* in Italy, 331
- Homadula albizziae*, on *Mimosa* in Florida, 543-545
- Homalodisia insolita*, fecundity of, 116
- Homalotylus flaminus*, bionomics of, parasitising Coccinellid larvae in France, 104; parasitising *Chilocorus* larvae in Israel, 390
- Homoeosoma nebulella*, infesting *Helianthus annuus* in China, 463
- Homona coffearia*, dieldrin killing *Macrocentrus homonae* parasitic in, on tea in Ceylon, 446
- Homona magnanima*, rearing of, on artificial food, 571
- Homocoryphus nitidulus vicinus*, *Glaurocara flava* parasitic in, in Tanganyika, 476
- Honduras, *Ips* spp. in, 205; mites of subfamily Phytoseiinae in, 211; *Bemisia tabaci* on cotton and other plants in, 401
- Honey, in diet for *Ceratitis capitata*, 51; in diet for *Athalia rosae*, 53; in diet for *Hylemya brassicae*, 154; in diets for *Ceratitis capitata*, 409; in diet for *Hylemya brassicae*, 489; in diet for *Coccinella septempunctata*, 595
- Honeydew, effect of, on growth of *Phoma herbarum medicaginis*, 26; produced by *Psylla pyricola*, 38; damage to fig trees by, insects attracted by, 98; Lachnids as source of, in forest districts, 99; sooty mould on, secreted by *Rhopalosiphum erysimi*, 146
- Hong Kong, *Pteroptrix albocincta* sp.n. from *Aonidiella citrina* in, 304; diseases and pests of economic plants of, 528; *Oryzaephilus surinamensis* in, 601
- Hooker HRS 1654 (see Decachlorobi-2,4-cyclopentadien-1-yl)
- Hoplocampa brevis*, on pear in North America, 210; on pear in Canada, 239
- Hoplocampa flava*, insecticides against, resistance to DDT in, on plum in Poland, 9; on plum in Poland, 453
- Hoplocampa minuta*, insecticides against, resistance to DDT in, on plum in Poland, 9; on plum in Poland, 453
- Hoplocampa testudinea*, on apple in Poland, 453
- Hoplostomus fuliginus*, attacking hive bees in Rhodesia, 394
- Hops, *Tetranychus telarius* on, in Poland, 515; *Tetranychus telarius* on, in Germany, 522
- Hormisca tatarianae*, parasitising *Heterographis fulvobasella*, 165



- Hormodendrum cladosporioides*, feeding and oviposition of *Cryptolestes ferrugineus* on, 540
- Hormones, controlling growth and development in insects, 297
- Horse-chestnut (see *Aesculus hippocastanum*)
- Horseradish, tolerance of, to methyl bromide fumigation and hot water treatments, 180
- Houses, damaged by *Hylotrupes bajulus* in Norway, 237; *Eupactus solidus* damaging timber in, 389; infestation of *Lyctus linearis* in, in Hungary, 402; *Chrysophana placida* infesting, in British Columbia, 420; *Halyomorpha picus* in, 546; invaded by *Porcellio scaber* and *Metoponorthus pruinosis* in Germany, 564; infestation by *Hylotrupes bajulus* in, in Germany, 658
- HRS 1671 (see Heptachlorohexahydroketomethanophthalan)
- Humidity, effects of, on Coleoptera, 4; effects of, on fecundity of weevils, 19; effects of, on persistence of insecticides, 46; effects of, on flight activity of *Hypera variabilis*, 63; effect of, on development of *Murgantia histrionica*, 67; effects of, on *Ptinus tectus*, 76; effects of, on arthropods in stored products, 78; effect of, on hatching and development of *Pseudaletia separata*, 88; effects of, on parasitism of eggs of *Panolis flammea* by *Trichogramma cacoeciae*, 96; effect of, on development of *Agrotis ipsilon*, 101; effect of, on Thysanoptera, 102; effect of, on fecundity in *Eurygaster integriceps*, effect of, on population dynamics of *Hypera* spp., 143; effect of, on diapause in *Mamestra brassicae*, 148; effect of, on survival of eggs of *Conoderus vespertinus*, 169; effects of, on *Eumerus strigatus*, 192; effect of, on development of *Coccinella septempunctata*, 214; effect of, on development of *Latheticus oryzae*, 254; effect of, on moisture content of *Acarus siro*, 290; effects of, on *Peregrinus maidis*, 300; effects of, on *Brevicoryne brassicae*, 332; effects of, on development of *Tribolium* spp., 336; effects of, on water loss in *Iridomyrmex detectus*, 344; effects of, on light reaction of *Meligethes aeneus*, 384; effects of, on *Carpoglyphus lactis*, 387, 388; effects of, on susceptibility of *Ephestia kuehniella* to *Bacillus thuringiensis*, 430; effects of, on development of *Sitona* spp., 447; effects of, on action of insecticides, 461; effects of, on development of *Acarus siro*, 466; effects of, on *Mayetiola destructor*, 487; effects of, on *Dalbulus maidis*, 500; effects of, on *Coleophora laricella*, 525; effects of, on *Spodoptera littoralis*, 528; effects of, on breeding rate of *Tyrophagus longior* and *Carpoglyphus lactis*, 546; responses of *Chrysomela varians* and *Pissodes pini* to, reactions of *Trypodendron lineatum* to, 571; effects of, on development of *Euzophera osseatella*, 611
- Hungary, effects of  $\gamma$ -radiation on granary insects and mites in, 324; *Anarsia lineatella* and *Cydia molesta* in, 333; *Leptinotarsa decemlineata* in, 340; occurrence of *Lyctus linearis* in, 402; entomogenous fungi isolated from *Hyphantria cunea* and *Leptinotarsa decemlineata* in, 428; control of *Hyphantria cunea* in, 430; *Ancyliis comptana* and *Pandemis dumetana* on strawberry in, 617; effect of photoperiod and temperature on diapause of *Athalia glabricollis* in, 632; use of radiation for control of insect pests in, 633
- Hyacinth, *Thrips tabaci* on bulbs of, in propagating rooms in Holland, 568
- Hyadaphis tataricae*, infesting *Lonicera tatarica* in Germany, 239
- Hyalesthes obsoletus*, as vector of stolbur virus in Bulgaria, 198
- Hyalomya aldrichii*, *Geocoris* spp., and *Nysius raphanus* attacked by, in California, 583
- Hyalopterus amygdali*, natural enemies of, on peach in Italy, 103
- Hyalopterus pruni*, on plum in Poland, 96; establishment of *Aphidius transcaspicus* against, on plum and *Phragmites* in Czechoslovakia, 391; on plum in Poland, 453
- Hyamine 2389 (see Methyl Dodecyl Benzyl Trimethyl Ammonium Chloride)
- Hybernia* (see *Erranis*)
- Hydraecia micacea*, on maize in Soviet Union, 13
- Hydrangea hortensia*, *Eupulvinaria hydrangeae* on, 460
- Hydrochloric Acid, in diet for *Diatraea saccharalis*, 268
- 2,3 - Hydro - 2,2 - dimethyl - 7 - benzofuranyl Methylcarbamate, in sprays against *Argyrotaenia velutinana*, persistence of, on grape foliage, 358
- Hydrogen Cyanide, toxicity of, to *Aonidiella aurantii*, 85; (as fumigant), against stored-grain mites, 200; (as fumigant), effect of, on *Tetranychus telarius*, 257; (as fumigant), not successful against *Eurytoma fellis*, 314; (as fumigant) ineffective against *Ephestia elutella* in stored tobacco, 355; as fumigant against *Quadraspidiotus perniciosus*, 519
- Hydrogen phosphide (as fumigant), against stored-grain mites, 200; effects of, as fumigant for cardamom, 398; as fumigant for bagged wheat under tarpaulins, 399
- Hydronomus sinuato-collis*, bionomics, injuriousness and control of, on rice in Soviet Union, 140
- p-Hydroxybenzaldehyde, effects of, on termites, 406
- p-Hydroxybenzoic Acid, effects of, on termites, 406
- 1-Hydroxychloridene (see 4,5,6,7,8,8-Hexachloro - 3a,4,7,7a - tetrahydro - 4,7 - methanoiden-1-ol)
- 3 - Hydroxy - N - methyl - *cis* - crotonamide Dimethyl Phosphate (see Dimethyl 1-Methylcarbamoyl-1-propen-2-yl Phosphate)
- Hydroxy-L-proline, inducing feeding response in *Choristoneura fumiferana* on *Picea glauca*, 158
- Hygromycin B, effects of, on reproduction of *Myzus persicae*, 496
- Hylastes annectens*, bionomics of, on *Picea engelmanni* in Colorado, 67
- Hylastes rufipes*, *Ceratocystis ulmi* in galleries of, on elm in Ontario, 179; transmitting *Ceratocystis ulmi* in North America, 502
- Hylemya*, on *Picea glauca* in Alaska, 21

- Hylemya antiqua*, mass rearing of, 53, 154; contact toxicity of insecticides to cyclodiene-susceptible and cyclodiene-resistant strains of, 163; bionomics of, on onion in Soviet Union, 194; insecticides against, on onion in New York State, 356, 357; use of scents to attract, in Britain, 399
- Hylemya brassicae*, insecticides against, on radish in New York, 36; mass rearing of, 53; on cauliflower and swede in Britain, insecticides against, 80; mass production of eggs and larvae of, for bioassay, 154; resistance to insecticides in, factors affecting diapause in, 154; broadcast treatments against, on swedes in Nova Scotia, 157; DDT and aldrin against, in Britain, 232; varietal resistance in crucifers to, in Wisconsin, 275; chemostimulation of oviposition by, 289; effect of beetle predators on, attacking brassica crops in Britain, 335; calculation of resistance factors in, 341; inheritance of dieldrin-resistance in, on Prince Edward Island, 352; alternatives to organochlorine insecticides against, on cruciferous vegetables in Britain, 386; use of scents to attract, in Britain, 399; control of resistant strains of, on swede in British Columbia, 420; control of resistant strains of, on radish in British Columbia, 421; mass rearing of, under controlled environmental conditions in Ontario, effects on reproduction and mortality of cyclodiene-susceptible and resistant strains of, 489; sterilization of, with apholate, 490; toxicity of insecticides to susceptible and cyclodiene-resistant strains of, in Ontario, 493; integrated control methods for, in Britain, varietal variations in resistance of brussels sprouts to, in Britain, 506; control measures against, on cabbage in Soviet Union, 511; insecticides against, on cabbage in Soviet Union, 552; bionomics and problems of control of, on crucifers in Belgium, 575; preyed on by *Bembidion* spp., in Holland, 576
- Hylemya cilicrura*, on radish in New York, 36; bionomics of, in Soviet Union, 141; rearing of, 154; method for mass rearing of, under controlled environmental conditions, in Canada, 363; infestation of, by *Strongwellsea castrans* in Wisconsin, 371
- Hylemya coarctata*, soil and seed treatments against, on wheat in France, 105; occurrence of, on cereals in Germany, bionomics and control of, 294; alternatives to organochlorine insecticides against, on wheat in Britain, 386; oviposition by, in relation to crop rotation in Germany, 565
- Hylemya floralis*, control of, on swede in British Columbia, 420; control measures against, on cabbage in Soviet Union, 511; insecticides against, on cabbage in Soviet Union, 552
- Hylemya fuxag*, associated with maize smut in Soviet Union, 141
- Hylemya nudibasis* sp.n., in Belgium 575
- Hylemya securis*, on cereals in Soviet Union, 141
- Hylemya trichodactyla*, insecticides against, on beans, maize and tobacco in Ontario, 43; bionomics of, in Soviet Union, 141; rearing of, 154; method for mass rearing of, under controlled environmental conditions, in Canada, 363
- Hylesinus kraatzii*, seasonal development of, on elm in Soviet Union, 89
- Hylesinus oleiperda*, occurrence and bionomics of, on ash in Sweden, 295
- Hylesinus vittatus*, seasonal development of, on elm in Soviet Union, 89
- Hylobius abietis*, on conifers in Norway and Sweden, studies on duration of life-cycle of, 57; *Beauveria bassiana* for control of, in Czechoslovakia, 428; outbreak of, and control measures against, on pine in Czechoslovakia, 517; development of, on conifers in north Europe, 563
- Hylobius congener*, bionomics and ecology of, in Canada and U.S.A., 20
- Hylobius pales*, method for collecting adults of, 542
- Hylotrupes bajulus*, on timber in Poland, 95; occurrence of, in Norway, 237; comparative development of, in larch and spruce wood, 401; diffusion of methyl bromide into pine wood during fumigation against, in Denmark, 402; toxicity of coniferous heartwood extractives and analogous compounds to larvae of, 405; wood components and development of larvae of, efficacy of wood preservatives against larvae of, 407; treatment of wood against, in Germany, 456; feeding zones of, in wood, 520; infestation by, in buildings in Germany, 658
- Hyalurgus lucidus*, parasitising *Hemichroa crocea* in Austria, 456
- Hylurgus ligniperda*, attacking pine in Spain, 128
- Hymenia recurvalis*, bionomics, biology and control of, on *Amarantus* spp. in India, 217
- Hymenoptera, parasitising Scolytids in California, 155; competition and co-operation among parasitic species of, 205; catalogue and bibliography of, in Philippines, 463
- Hypera jussalis*, *H. strigata* misidentified as, 129
- Hypera strigata*, misidentified as *H. jussalis*, released against *Lantana camara* in South Africa, 129
- Hypera*, infesting clover in Soviet Union, 552
- Hypera meles*, population dynamics of, on clovers in Soviet Union, 143
- Hypera nigrirostris*, population dynamics of, on clovers in Soviet Union, 143
- Hypera punctata*, *Biolysia tristis* parasitic in, on clover in U.S.A., 364; *Biolysia tristis* parasitic in, in New Jersey, 369
- Hypera variabilis*, insecticides against, on lucerne in New York, 36; migration and flight habits of, 62, 63; on lucerne in Arkansas, 159; *Bathyplectes curculionis* reared from, in Illinois, 168; improved laboratory storage of, 169; insecticides against, on lucerne and maize in New York, 276; artificial diets for rearing of, 285; photoperiod control device for studies on, attacked by *Beauveria bassiana* in New York, 296; predators and parasites of, control measures against, on lucerne in Turkmenia, 323; sterilizing effects of X-rays on males of, 355;



- Patasson conotracheli* overwintering in eggs of, in U.S.A., 359; oviposition by, for timing autumn control measures in lucerne fields in New York State, 362; comparison of methods for collection of, on lucerne in Massachusetts, 368; *Bathyplectes curculionis* parasitic in larvae of, on lucerne in Delaware and New Jersey, *Spilochalcis albifrons* as parasite of pupae of, 369; attraction of, to lucerne in Maryland, effect of aestivation, photoperiod, and diet on fatty acids in, in South Carolina, 413; heptachlor against, on lucerne in Maryland, 419; bibliography of, 463; aerial application of insecticides against, on lucerne in Kentucky, 493; spring and autumn applications of insecticides against, on lucerne in Virginia, 497; natural enemies, bionomics and control of, on lucerne in Iran, 570; insecticides against, on lucerne in New York, 580; effect of spray volume and pressure on control of, on lucerne in Maryland, 594; effect of cold storage on eggs and larvae of, 595; multi-photoperiod constant temperature chamber for, 619
- Hypphantria cunea*, entomogenous fungi isolated from, in Hungary, 428; *Bacillus thuringiensis* for control of, in Hungary, 430; electron microscopy study of granulosis virus of, in Yugoslavia, 431; methyl bromide fumigation of fruits infested by, in Soviet Union, 510
- Hypoaspis aculeifer*, biology of, on *Parisotoma notabilis* and *Tyrophagus putrescentiae* in Canada, 308
- Hypocala andremona*, bionomics of, on persimmon in Brazil, 242; insecticides against, on persimmon in Brazil, 639
- Hypogastrura*, on grass and white clover in Holland, in relation to injurious fungi, 383
- Hypolithus abbreviatus*, damaging potato in Quebec, 157
- Hypomicrogaster*, restored status of, as genus, and species of, 55
- Hyponomeuta*, *Agria mamillata pacifica* predacious on larvae of, in Soviet Union, 322
- Hyponomeuta euonymellus*, glycerol content and cold-hardiness of, in Norway, 423
- Hyponomeuta padellus*, insecticides against, tests of *Bacillus thuringiensis* against, on *Prunus spinosa* in Germany, 54; parasitism of, on apple in Italy, 330; comparative spray tests with *Bacillus thuringiensis* against, on *Prunus* in Germany, 337; differences between *Hyponomeuta padellus malinellus* and; bionomics of, on plum and apple in Switzerland, 561
- Hyponomeuta padellus malinellus*, effects of temperature on larvae of, in Yugoslavia, 7; bionomics and phenology of, in Poland, 97; comparative spray tests with *Bacillus thuringiensis* against, on apple in Germany, 337; natural enemies of, on apple in Yugoslavia, 392; on apple in Poland, 453; parasites and predators of, on apple in Soviet Union, 553; differences between *Hyponomeuta padellus* and; bionomics of, on plum and apple in Switzerland, 561
- Hypoptya agavis*, parasitised by *Cerogenes auricoma*, bionomics of, on *Agave* in Mexico, 409
- Hypoater*, parasitising *Heliothis* spp., in U.S.A., 539
- Hypothenemus*, associated with cacao in Costa Rica, 375
- Hypothenemus hampei*, control of, by *Prorops nasuta* in Brazil, 242; sampling methods in tests for control of, on coffee in Brazil, 300
- Hyssopus thymus*, parasitism by, of *Rhyacionia buoliana* on pine in Maryland, 304

## I

- Ibalia*, parasitising Siricids, 68
- Ibalia ensiger*, parasitising Siricids in California, 68
- Icerya purchasi*, insecticides against, on fruit trees in Malta, 135; on *Citrus* in Iran, 519
- Ichneutes reunitor*, parasitising *Pristiphora abietina* on spruce in Germany, 566
- Idaho, *Miccotrogus picirostris* on white clover in, 29; DDT residues in big game animals in, 641
- Idechthis* (see *Devoigilla*)
- Idiopsis coerulea*, attacking rubber trees in Territory of Papua and New Guinea, 480
- Idiopsis grisea*, attacking rubber trees in Territory of Papua and New Guinea, 480
- IHA, against *Lymantria dispar*, 389
- Ilex*, *Asterolecanium puteanum* on, in Florida, 543
- Ilex opaca*, wing-vein abnormality in *Phytomyza ilicicola* on hybrid and cultivated varieties of, in U.S.A., 540
- Illinois, *Agallia constricta* on lucerne in, virus disease of lucerne in, 70; *Mayetiola destructor* on hybrid wheat in, 163; *Bathyplectes curculionis* reared from *Hypera variabilis* in, 168; *Popillia japonica* on soy beans in, 281; natural enemies of *Trialeurodes abutilonea* in, 304; *Biolysia tristis* parasitising *Hypera punctata* in, 364; effect of temperature on development of *Empoasca fabae* in, 412; repopulation of thrips in areas previously treated against *Popillia japonica* in, 497
- Imidan, ineffective against *Miccotrogus picirostris*, 29; degradation of, in soils, 30; in sprays against *Conotrachelus nenuphar*, 165; against *Tribolium* spp., 254; swollen abdomens in *Cydia molesta* treated with, 276; against *Rhagoletis pomonella*, 301; effect of sprays of, against *Frankliniella fusca* on yield of groundnuts, 376; against *Hypera variabilis*, 497; in sprays against *Chlamysus cribripennis*, 581; alone and with oil emulsions, in sprays against *Thrips tabaci*, 590; in sprays against *Bryobia rubrioculus*, 640
- Imidan-C<sup>14</sup> (see N-(Mercaptomethyl)-phthalimidecarbonyl - C<sup>14</sup> - S - (O,O-dimethylphosphorodithioate))
- 2-Imidazolidinone, guide to, 297
- Imidazoline-2-thione, effect of, on *Anthonomus grandis*, 277
- India, *Scirpophaga nivella* on sugar-cane in, 48; *Schistocerca gregaria* in, 51; natural enemies and diseases of *Nephantis serinopa* on coconut in, 56; *Anonaepestis bengalella* on

*Annona squamosa* in, 73; book on plant protection in, *Pipal diplois pipal diplois* on *Ficus religiosa* in, aphids on *Citrus* in, tristeza virus of *Citrus* in, 84; *Coccinella septempunctata* in, *Aonidiella aurantii* on rose in, *Lachnosterna* on sorghum and ground nuts in, locusts in, 85; *Spodoptera litura* on cauliflower in, *Empoasca devastans* on *Hibiscus esculentus* in, *Nipaeococcus vastator* on *Citrus*, vines, *Euphorbia hirta* and *Dalbergia sissoo* in, parasites of *Nipaeococcus vastator* in, *Leucania loreyi* and *Agrotis spinifera* in, pests of wheat in, 86; *Nephotettix* sp. in, 87; *Schistocerca gregaria* in, 111; *Tribolium castaneum* on maize in; pests of crops in, 115; *Myzus persicae* and *Aphis gossypii* on potato in, *Rhopalosiphum erysimi* on crucifers in, 146; parasites of *Microtharus* spp. in, 170; pests of tea in, 185; *Apion corchori* on jute in, 213; *Dacus* spp. in orchards in, *Amsacta moorei* and associated species in, *Tanymecus indicus* in, 214; *Pectinophora gossypiella* on cotton in, pests of cotton in, *Callosobruchus chinensis* on *Vigna unguiculata* (catjang) in, 215; *Argyroploce leucaspis* on *Litchi chinensis* in, *Heterotermes indicola* damaging timber in, protection of oilseeds in, insect pests of groundnut in, *Papilio demoleus* on *Citrus* in, *Antigastra catalaunalis* attacking *Sesamum orientale* in, 216; new virus diseases of *Cajanus cajan* and papaya in, *Hymenia recurvalis* on *Amarantus* spp. in, *Taeniothrips setiventris* and *Scirtothrips dorsalis* on tea in, 217; *Dacus* spp. in, use of drupes of *Melia azedarach* against *Pieris brassicae* in, 218; *Mylabris* spp. damaging maize in, *Schistocerca gregaria* in, *Isotima javensis* parasitising *Scirpophaga nivella* and *Tryporyza incertulas* in, pests of tea in, 219; insects affecting solanaceous plants in, *Aleurolobus barodensis* and *Neomaskellia bergii* on sugar-cane in, storage of food grains in, 238; *Polytela gloriosae* infesting lilies in, 258; *Lachnosterna serrata* damaging *Butea monosperma* in, use of *Azadirachta indica* as protectant against stored grain pests in, *Amsacta moorei* in, transmission of broad bean mosaic virus by *Aphis craccivora* in, 259; *Earias fabia* on *Hibiscus esculentus* in, *Pseudaletia unipuncta* on sorghum in, 260; *Callispa* sp. feeding on coconut in, *Pyemotes ventricosus* in cocoons of *Bombyx mori* in, 261; *Clania crameri* in, *Atherigona indica* on sorghum in, *Labio-proctus polei* on orange in, 262; identification of grasshoppers in, *Tribolium castaneum* on sorghum in, *Anicetus* spp. n. attacking *Ceroplastes* spp. in, 295; *Pruthiana sexnotata* on sugar-cane in, 300; *Oryctes rhinoceros* as pest of coconut in, 313; survey of entomology in, storage of grain and other food commodities in, *Dacus cucurbitae* in, 316; transmission of *Chirke* disease to cardamom and wheat by aphids in, hoppers of *Schistocerca gregaria* in, *Aonidiella aurantii* in, *Aphis craccivora* on groundnut in, *Bracon brevicornis* in, 317; *Oligonychus indicus* on sugar-cane and other crops in, *Achaea janata* on castor in, pests of groundnut and parasites of *Stomopteryx subsecivella* in, *Lepidosaphes*

*cornutus* on *Piper betle* in, identification of *Pseudaletia separata* in, *Pieris brassicae* on cruciferous crops in, 318; *Quadraspidotus perniciosus* in, new hosts of *Bracon hebetor* in, *Entomophthora* sp., on *Empoasca devastans* in, species and hosts of *Anastatus* in, 343; *Anomis sabulifera* on jute in, 372; pests of tea in, *Cydia leucostoma* on tea in, *Helopeltis theivora* on tea in, *Scirtothrips bispinosus* on tea in, 397; *Calacarus carinatus* and *Scirtothrips bispinosus* on tea in, fumigation of stored cardamom pods in, 398; insects infesting processed food bari in storage in, fumigation against pests of stored wheat in, 399; pests of *Amomum subulatum* in, *Euprocitis fraterna* on *Ricinus communis* in, *Chilo partellus* on maize, sorghum and sugar-cane in, control of *Galerucella birmanica* on *Trapa bispinosa* in, 440; *Echinocnemus oryzae* on rice in, 441; insect control in stored wheat in, 463; *Amphibolus venator* preying on *Trogoderma granarium* in stored grain in, BHC for control of stored product pests in, 476; method for controlling *Cadra cautella* in stored grain in, daylight reducing infestation of stored wheat by *Ephestia* sp. in, *Cecidomyiids* infesting mango inflorescence in, 477; *Dasyneura citri* feeding on flower buds of *Citrus* in, *Udumbaria nainiensis* on fig in, *Dyodiplois glomeratii* on *Ficus glomerata* in, *Pyrilla perpusilla* on sugar-cane in, 478; *Sesamia inferens* and *Proceras indicus* on sugar-cane in, control of sugar-cane pests in, *Aphis sacchari*, *Aphis indosacchari* and predators on sugarcane in, *Pyrilla perpusilla* on sugar-cane in, 479; *Tropidocephala* spp. on sugar-cane in, *Apis dorsata* removing pollen of oil palm in, 480; *Tryporyza innotata* in, 481; *Antilochus coquebertii* as predator of *Dysdercus koenigii* in, 501; *Protaetia aurichalcea* feeding on pollen stores of *Apis indica* in, 534; *Schistocerca gregaria* in, 597; control of *Planococcus lilacinus* and associated ants on coffee in, 614; *Xylosandrus compactus* on coffee in, protection of freshly felled timber against insects in, 615; *Digama hearseyana* on *Carissa carandas* in, 638; *Tetranychus telarius* infesting *Solanum melongena* in, parasites of *Orthaga* sp. on *Syzygium fruticosum* in, 662; *Sternocera aequisignata aurosignata* infesting shade trees in, mites of tea and ancillary crops in, first record of *Thosae aperiens* in, 663; protection of stored potatoes from *Phthorimaea operculella* in, *Elymnias caudata* on *Areca catechu* in, *Neocypholaelaps stridulans* and *Lasioseius* sp. on *Areca catechu* in, *Anarsia* sp., attacking *Achras zapota* in, *Blissus gibbus* infesting sugar-cane in, control of *Aleurolobus barodensis* on sugar-cane in, 664  
 Indian Lilac (see *Melia azedarach*)  
 Indiana, varietal resistance of maize to *Diabrotica longicornis* in, 163; *Lema melanopa* on graminaceous plants in, 307; *Entomophthora* infection in *Reticulitermes flavipes* in, 371; nucleopolyhedrosis of *Rachiplusia ou* infesting mint in, 535; *Beauveria rileyi* in *Trichoplusia ni* in, 537; *Stenodiplois bromicola* on *Bromus* spp. in, 639



*Indigofera*, *Aphis craccivora* on, migrating to groundnuts in Uganda, 133  
*Indigofera teysmanni*, mites on, in India, 663  
 Indole, effect of, on *Anthonomus grandis*, 277  
 Indonesia, pests of tea in, 185; *Tryporyza innotata* in, 481  
 Indopol H-100 (see Polybutene)  
 Infra-red Cinematography, of *Ostrinia nubilalis*, 404  
 Infra-red Energy, question of relation of, to communication in Noctuids and Sphingids, 64  
 Infra-red Irradiation, of overwintering larvae of *Pectinophora gossypiella*, 463  
*Inocellia crassicornis*, preying on *Aradus cinnamomeus* in Czechoslovakia, 454  
 Inorganic Ions, transport of, in insects, 297  
*Inostemma walkeri*, parasitising a race of *Contarinia citri* in Sicily, 606  
 Insecticides (including acaricides), standardisation of names for, 1; toxicity of, to bees, 9; effects of humidity on persistence of, 46; list of, and synonyms, 58; problems of persistence of, annual usage of, in Britain, question of hazards in use of, 80; surveys of data on, 81; survey of use of, in India, 84; structure in relation to toxicity of, 114; influence of development of, on production of fruit and hops, 116; resistance to, in *Drosophila melanogaster*, 126; method for observing spray pattern of, 180; toxicity and penetration of, 184; symposium on, synergism of, 185-186; photodecomposition of, inhibition of metabolism of, by methylenedioxybenzenes, effects of chemical structure on intoxication and detoxication of, in insects, structure of, in relation to anticholinesterase activity, 186; with Schiff bases, 188; planning field tests of, against stored products pests, for treatment of stored wheat, 238; behaviour of, in soils, selectivity of, in relation to toxicity to honey bees, tainting of apples, pears and grapes by, ground-water contamination by, 240; formulation and guide to, 246; relation between structure and activity in investigation of action of, in relation to fresh-water ecological systems, effects of, in domestic animals, persistence of residues of, in foods, 248; toxicological evaluation of low-level, long-term exposures to, in man, clinical studies of exposures to, in man, experimentation with, using volunteer subjects, 249; insect metabolism in relation to, guide to new compounds, 297; in rainwater, 298; methods for evaluating, against *Hypothenemus hampei* on coffee, 300; tree planter attachments for treatment of conifer seedlings with, 309; inheritance of resistance to, in *Drosophila*, 315; in India, 316; against pests of grain crops, 319; effect of, on insect fauna on apple, 330; against *Trogoderma granarium* in oil-seed cake, 333; resistance to, in *Hylemya brassicae*, 341; microapplicator for topical doses of, 344; soil treatment with, against *Hylemya antiqua* in New York State, against *Spodoptera littoralis*, 357; method for testing, against larvae of *Agrotis ipsilon*, 370; phosphorimetric study of, 374; against

agricultural pests, 377; isoboles for graphic representation of synergism in, 382; chemical analysis of, selective detection of phosphorus, sulphur and halogen in, by microcoulometric gas chromatography, 404; reference standards of Entomological Society of America for, 463; effect of, on production of glasshouse crops, insect cross-resistance to, analytical method for, in protein materials, residues of, in grain sorghum and Bermuda grass, metabolites of, formed by rat liver microsomes, separation of, by thin-layer chromatography, 464; labelling of, with radioisotopes, residue analysis and screening of, by gel diffusion, 465; toxicity of, to celery, 469; bioassay of, determination of residues of, using *Daphnia magna* and *Culex pipiens*, 473; contamination with, of spray operator using knapsack sprayer, 474; application of, in capsule form, 492; resistance to, in *Drosophila melanogaster*, 565; legislation and control of, in Britain, progress in metabolic studies of, in insects and mammals, 572; book on use of, enzymes and mutations in resistance to, in *Musca domestica* and *Tetranychus telarius*, 574; supplement to a review of hazards of, hand seeder adapted for application of, in granules, 619; genetic studies on resistance to, in insects, 622; distribution of, in soils following application by soil injector rod, 640 (see also Pesticides)  
 Insects, book on physiology of, book on control of, with fungi, 3; predacious on Bruchids, 5; effects of static electricity on captures of, in traps, 22; tissue culture of, 57; theory of communication between, 64; apparatus for measurement of feeding by, 72; method of detecting, in stored wheat, 79; classification of, overwintering in bark of apple in Poland, 95; list of, and their natural enemies, in South Africa, 110; survey of data on, in Ghana, 114; natural enemies of, reared in Austria and Czechoslovakia, 116; survey of data on sex attractants produced by, 118; aspects of biological and integrated control of, 121; fluctuations in populations of, injurious to fruit trees, 122; armed forces' manual on control of, in Canada, 158; as predators on cotton in Arkansas, 179; of micronesia, bibliography on biological control of, 180; competitive displacement between ecological homologues in, in epidemiology of plant viruses, functional system of adaptive dispersal by flight in, use of ovicides against, chemical attractants and repellents for, fungal parasites of, 184; control of, as applied form of population ecology, economic implications, habits, and control of, 185; effects of chemical structure on intoxication and detoxication of phenyl N-methylcarbamates in, 186; population dynamics of, 196; as pests of tea in India, 219; calculation of capacity for increase of, 233; affecting solanaceous plants in India; of stored grains in India, 238; chronological table of control of; light as ecological factor in life of; in Canada, approved common names of;

- attacking coffee in Kenya, 239; microbial control of; modern control agents for, 240; sterility method of control of; role of biological control in suppression of, 248; control of, in Argentina, use of pheromones of in pest control, 288; corrections to list of common names of, ultraviolet traps for, 295; extraction of eggs of, from soil, 296; aspects of physiology and biochemistry of, review of physiology, of 297; effect of environmental conditions on sampling of, on soy bean in Arkansas, 302; attacking pine cones in Arkansas, 303; distribution of, on pine in Maryland, 304; machine method for mapping survey records for, 309; parasitic in *Musgraveia sulciventris* in New South Wales and Queensland, attacking *Hakea* spp., in New South Wales, 314; estimation of populations of, and assessment of crop losses caused by, in India, 316; protection of grain crops from, in Soviet Union, 319; effects of windbreak on aerial density of, in Britain, 335; natural enemies of, in Canada; as pests of raspberry and other cane fruits in Canada; control of, on potato in U.S.A., 343; host list of, in Thailand; review of plant resistance to attacks by, parasites for control of; field-note form for collecting, 344; labelling of, with radioisotopes, 365; measures for control of, in Brazil, 377; as pests of granaries overwintering in nearby trees in Portugal, 387; control of, on crops in Italy, 390; plant viruses transmitted by, 396; harmful to timber; literature on control of, in Finland, 403; pyrethrum against, in Finland; container for rearing with potential application to controlled humidity experiments; method for repointing dissecting forceps for, 404; advances in physiology of, 405; efficacy of wood preservatives against, 407; production of viruses for use against, 425; colloquium on pathology and microbiological control of, 426-433; diagnosis of diseases of; biological control of, in Soviet Union; infection of, by Protozoa and nematodes; review of fungi attacking, 427; entomophthoraceous fungi on, in Poland and Switzerland; infected by *Bacillus thuringiensis*, 428, 430; viruses and ecology of viruses of, 431; micro-organisms pathogenic to, 432; ecological methods for study of, 451; role of predators in sterile release programmes for; control of, in stored wheat in India; portable, power-driven sifter for studies of, in soil; ecology in control of, 463; cross-resistance phenomena in, 464; infestation and control of, in stored products, 465; temperature beneath emergence traps for, 468; on *Citrus* in Philippines, 480; in stored products in Canada, 502, 503; symposium on integrated control of, mechanisms of host plant selection by, in Britain, 506, 507; on fruit trees in Iran, 519; of Micronesia, 523; fan for handling of, 524; infesting tea; as pollinators, 525; of cultivated and wild plants in Ethiopia, 529; of economic importance in Finland, 571; factors affecting susceptibility of, to viruses, metabolic studies of cyclodiene insecticides in 572; culture-jar modifications for sampling respiratory environments of, 595; protection of freshly felled timber in storage against, in India, 615; annotated list of, introduced into Israel; of Micronesia, 620; genetic studies on insecticide resistance in, 622; traps for, and methods of assessing populations of injurious species of, in orchards, 629; use of radiation for control of, in Hungary, 633; evaluation of responses of, as parasites and predators, 651; use of light-traps for estimating populations of, 661
- Intration (see Thiometon)
- Iodine, Radioactive, use of, in study of colonies of *Camponotus herculeanus* damaging forest trees, 456
- Ions, Inorganic, transport of, in insects, 297
- Iowa, decline in insecticide residues on lucerne in, 156; *Ostrinia nubilalis* on maize in, 35, 162; predators of *Ostrinia nubilalis* on maize in, 274; *Diabrotica virgifera* on maize in, 368; *Evora hemidesma* on *Spiraea vanhouttei* in, 410; *Ostrinia nubilalis* on maize in, 492; holocyclic strain of *Therioaphis trifolii* on lucerne in, 493; biotypes of *Ostrinia nubilalis* from, 587
- Ips*, new species of, from North America, and North American species in Group VI of, 310; *Macrocheles boudreauxi* sp.n., associated with, in U.S.A., 571
- Ips amiskwienensis*, on spruce in North America, 153
- Ips borealis*, on spruce in North America, 153
- Ips calligraphus*, artificial rearing medium, for 209; attraction of, to artificially infested pine in Florida, 210
- Ips carinulatus*, effect of insect attractants on, on pine in Nevada, 303
- Ips chagnoni*, as synonym of *I. grandicollis* in North America, 205
- Ips confusus*, BHC against on pine in California, 41; *Tomicobia tibialis* parasitising, on pine in California, 206; studies on sex pheromone of, 409; antennal receptors and olfactory response of, to male sex attractant, 411
- Ips cibricolis*, in North America, 206
- Ips curvidens*, effects of fertilised and unfertilised soil on resistance pine of to, in Germany, 576
- Ips engelmanni*, on spruce in North America, 153
- Ips erosus*, *Ips tridentatus* distinguished from, in Turkey, 380
- Ips grandicollis*, in North America, *Ips chagnoni* as synonym of, in North America, 205; attraction of, to artificially infested *Pinus elliottii* in Florida, 210
- Ips hunteri*, on spruce in U.S.A., 310
- Ips interpunctus*, in North America, 310
- Ips interruptus*, on spruce in North America, 153
- Ips lecontei*, in North America, 205
- Ips montanus*, in North America, 205
- Ips perturbatus*, on spruce in North America, 310
- Ips pilifrons*, on spruce in United States, 153
- Ips semirostris*, on spruce in North America, 153



- Ips spinidens*, effect of osmotic pressure of tree sap on development of, in Germany, 576
- Ips sulcifrons*, on spruce in North America, 153
- Ips swaini*, on spruce in British Columbia, 153
- Ips thomasi* sp.n., on spruce in Nova Scotia, 153
- Ips tridens*, on spruce in North America, 153
- Ips tridentatus*, distinct from *Ips erosus*, attacking cedar in Turkey, 380
- Ips typographus*, effect of osmotic pressure of tree sap on development of, in Germany, 576
- Ips utahensis*, on spruce in U.S.A., 310
- Ips woodi* sp.n., on *Pinus flexilis* in U.S.A., 310
- Ips yohoensis*, on spruce in North America, 153
- Iraq, *Kermania pistaciella* on *Pistacia vera* in, pests of fruit trees in, 10; *Schistocerca gregaria* in, 16; control of locusts in, 168; migration of *Aelia* and *Eurygaster* spp. in, 273; review of insect and mite pests in, 519; *Hypera variabilis* on lucerne in, 570; survey of useful and injurious Coccinellids in, 614
- Iraq, *Schistocerca gregaria* in, 17; *Bombyx mori* on mulberry in, pests of cotton in, *Tetranychus atlanticus* on cotton in, 103; insect pests of pea in, 584
- Ireland, Northern, *Anuraphis helichrysi* transmitting tobacco vein necrosis virus of potato in, 336
- Iridomyrmex *detectus*, influence of temperature and humidity on water loss in, 344
- Iridomyrmex humilis*, attacking hive bees in Rhodesia, 394
- Iron (as plant nutrient), effect of, on fecundity of *Tetranychus telarius*, 274
- Ischnonyx prunorum*, bionomics of, in Bulgaria, 327
- Iso-amyl Acetate, in baits for *Rhynchophorus palmarum*, 42
- Isobenzan, against *Chilo suppressalis*, 48; toxicity of, to *Heterotermes indicola*, 216; toxicity of, to *Amsacta moorei*, 259; in sprays against *Echinocnemus oryzae*, 441; effect of, against cotton pests, on crop yields, 442; against *Phthorimaea operculella*, 449; against *Chilo auricilius* and *Scirpophaga nivella*, soil treatments with, against termites and *Chilo infuscatellus*, 479; in sprays against *Heliothis zea*, 486; resistance to, in *Hylemya brassicae*, 493; soil treatment with, against *Planococcus lilacinus*, 614; in sprays against *Xylosandrus compactus*, 615; soil treatment with, against *Sternocera aequisignata aurosignata*, 663; for protection of stored potatoes from *Phthorimaea operculella*, 664
- Isoborlinia scheffleri*, attacked by *Prosopocera* sp. in East Africa, 444
- 4 - Isobutylideneamino - 3,5 - dimethylphenyl Methylcarbamate, toxicity of, to *Epilachna varivestis* and *Spodoptera eridania*, 188
- Isodrin, contact versus stomach toxicity of, to *Spodoptera littoralis*, 269
- Isolan, effects of, on bioassay of Bidrin, 28; in dusts against *Oxycaenus hyalinipennis*, 243; applied to seed furrow against *Atherigona indica*, 262; and phosphorus insecticides, against *Drosophila melanogaster*, 599; in sprays against aphids, method for assessing effect of, on fauna of fruit trees, 629; *Myzus persicae* not resistant to, 650
- Isoparaffinic Solvents, as bases for pyrethrum insecticides, 403
- Isopropanol, in baits for insects, 399
- 2-Isopropoxyphenyl N-methylcarbamate, (see Arprocarb)
- Isopropyl Amine Dodecyl Benzenesulphonate, as emulsifier for DDT, 366
- Isopropyl 3-Chlorophenylcarbamate, and insecticides, effect of, on cotton seedlings, 596
- Isopropyl 4,4'-Dichlorobenzilate, (see Chloropropylate)
- Isopropyl 2,2-Dichlorovinyl Phenyl-phosphonate, toxicity of, to agricultural insects, 283; mouse toxicity and anticholinesterase activity of, to *Ceratitis capitata*, 292
- Isopropyl 2,4-Dinitro-6-sec.-butylphenyl Carbonate (see Dinobuton)
- Isopropyl 2-(1-Methyl-n-butyl)-4,6-dinitrophenyl Carbonate (see Dinopenton)
- M-Isopropylphenyl Methylcarbamate, contact versus stomach toxicity of, to *Spodoptera littoralis*, 269; against *Spodoptera littoralis*, 357
- 3-Isopropylphenyl Methylcarbamate, effects of structure on biological activity of, 420
- 3-Isopropylphenyl Trifluoremethylcarbamate, effects of structure on biological activity of, 420
- Isopropyl P-2-Thienyl-P-(2,2,2-trichloro-1-hydroxyethyl) phosphinate, toxicity of, to agricultural insects, 283
- M-Isopropylthiophenyl Methylcarbamate, against larvae of *Culex pipiens fatigans*, 373
- Isopyrethrins, toxicity of, to insects, 112
- Isotima javensis*, distribution and hosts of, in India, 219
- Isotoma violacea*, on grass and white clover in Holland, in relation to injurious fungi, 383
- Isotima viridis*, on grass and white clover in Holland, in relation to injurious fungi, 383
- Israel, *Trogoderma granarium* on stored wheat in, 5; *Agrotis ipsilon* in, 101; insects infesting stored dates in, 143; *Parlatoria blanchardii* on date palms in, 144; *Bemisia tabaci* transmitting cucumber vein yellowing virus in, 237; *Phoracantha semipunctata* in, 245; *Clausenia josefi* sp.n. parasitising *Planococcus* sp. in, 257; *Clausenia purpurea* controlling *Pseudococcus citriculus* on Citrus in, 257; *Chilocorus bipustulatus* preying on Coccids on Citrus in, 258; *Anarsia lineatella* in, 333; *Phthorimaea operculella* on potato and eggplant in, *Chilo agamemnon* on maize in, 339; *Thaumetopoea* spp. in, 388; *Chilocorus bipustulatus* on orange in, 390; *Saissetia oleae* on Citrus and olive in, 400; *Sitona* spp., injuring leguminous crops in, 447; effects of rearing conditions on *Spodoptera littoralis* in, 528; *Stethorus punctillum* as predator of *Tetranychus cinnabarinus* on beet in, 558; rearing and transporting predacious mites for release on Citrus in, 584; *Euzophera osseatella* in, 611; *Earias insulana* on *Malva sylvestris* in; *Pseudaletia unipuncta* in; *Sitona* spp., infesting leguminous crops in, 612; control of *Ceratitis capitata* on fruit trees in; *Phthorimaea oper-*

*culella* on potato in, **613**; annotated list of insects and mites introduced into; list of parasites of Lepidoptera in, **620**; recorded aphid vectors not transmitting *Citrus tristeza* virus in; *Contarinia citri* on *Citrus* in; insect pests of *Carthamus tinctorius* in; keys for identification of parasites of *Citrus* pests in, **636**; relation between *Dacus oleae*, *Prolasioptera berlesiana* and *Macrophoma* spot on olive in, **637**; control of *Dacus oleae* on olive in, **638**

*Isurgus heterocerus*, parasitising *Meligethes aeneus* on rape in Sweden, **182**; effect on, of control measures against rape pests in Germany; parasitising *Meligethes aeneus*, **618**

*Isurgus morionellus*, parasitising *Meligethes aeneus* on rape in Sweden, **182**; as parasite of *Meligethes aeneus*, effect on, of control measures against rape pests in Germany, **618**

Italy, pests of apple in, **5**; pests of vegetables and fruit trees in, **92**; *Cydia pomonella* on apple in, **93**; *Saissetia oleae* on olive in; *Cryptorhynchus lapathi* on poplar in; coccids on *Citrus* in, **94**; aphids on *Citrus* and peach in, **103**; parasites of *Microlarinus* spp. in, **170**; *Ceroplastes sinensis* on pear in, **246**; Coccids causing spotting of plums in, **328**; termites damaging trees and timber in, **329**; arthropod fauna of apple in; *Archippus oporanthus* on apple and pear in, *Cydia pomonella* in, **330**; *Aculus pelekassi* and *Phyllocoptura oleivora* on *Citrus* in; *Heterarthrus ochropodus* on poplar in; *Chrysomela americana* on rosemary in, **331**; *Brevicoryne brassicae* in; *Javesella pellucida* and *Laodelphax striatella* transmitting maize rough dwarf virus in, **332**; *Anarsia lineatella* and *Cydia molesta* in, **333**; *Contarinia sorghicola* and associated Hymenoptera on sorghum in, **389**; integrated control of crop pests in; winter control of Coccids on fruit trees in, **390**; *Zeiraphera diniana* on larch in, **520**; witches'-broom viruses in, **568**; Aphidiine parasites of aphids in, **603**; use of *Opus concolor siccus* against *Dacus oleae* in, **607**; *Euzophera osseatella* in, **611**; *Trioza tremblayi* infesting onion in, **627**; effects of carbaryl on insect fauna of olive and *Citrus* in, **628**; control of spider mites on fruit crops in, **651**

*Ithone hexaspilota* (see *Aiolocaria*)

*Itopectis alternans*, parasitising *Archips crataeganus* on oak in Soviet Union, **142**

*Itopectis conquistor*, parasites of, in Virginia; parasitising *Thyridopteryx ephemeraeformis* in Virginia, **29**; parasitising *Archips cerasivoranus* in Minnesota, **642**

*Itopectis maculator*, parasitising *Tortrix viridana* on oak in Europe, **123**; parasitising *Archips crataeganus* on oak in Czechoslovakia, **199**; parasitising *Tortrix viridana*, **426**; host-seeking by; parasitising *Tortrix viridana*, **567**

Ivory Coast, *Epicampoptera strandi* on coffee in, **108**; pests of cacao in, **109**; *Oryctes* spp. on coconut in, **334**

Ivy, *Tetraleurodes hederæ* on, in Soviet Union, **510**

## J

Jack Pine (see *Pinus banksiana*)

Jamaica, *Aleurocanthus woglumi* in, **172**; *Saccharosydne saccharivora* on sugar-cane in, **289**; lethal yellowing disease of coconut in, **403**

*Janus compressus*, as a pest of pear in Bulgaria, **556**

Japan, *Aphycus orientalis* in, **61**; *Sitophilus* spp. in, **78**; *Agromyza morivora* on mulberry in, **87**; *Nephotettix* sp., transmitting virus diseases of rice in; *Odonaspis secreta* on bamboo in, parasites of *Odonaspis secreta* in, **87**; *Microterys amamensis* parasitising *Ceroplastes pseudociferus* in; *Carcelia bombylans* parasitic on *Dendrolimus spectabilis* in, **115**; *Chilo suppressalis* on rice in, **147**; orchard illumination against fruit-piercing moths in; *Mamestra brassicae* on cabbage in, diapause in *Mamestra brassicae* in, **148**; *Tetranychus kanzawai* on tea in; *Xylosandrus* spp. on tea in, **149**; *Laodelphax striatella* on rice in, **150**; dispersal of *Nezara viridula* in, **151**; symposium on insecticide resistance of pest insects in, **315**; *Epilachna sparsa orientalis* in, **343**; list of injurious insects found on imported logs at Osaka in, **403**; development of winged forms in *Brevicoryne brassicae* on kale in; effects of temperature on *Rhopalosiphum erysimi pseudobrassicae* in, **438**; *Nephotettix cincticeps* on rice in, **545**; microapplication of insecticides to *Nephotettix cincticeps* in; *Halyomorpha picus* in, **546**; nymphal aggregation of *Eurydema rugosum* and *Nezara viridula* in; *Xylosandrus germanus* on tea in; *Adoxophyes orana* in, **547**; *Plodia interpunctella* in; *Unaspis yanoensis* on *Citrus* in; *Mamestra brassicae* on cabbage in; water content of Bruchids in, **548**; larch pests and their parasites in, **660**

Japanese Larch (see *Larix leptolepis*)

Jasmine (see *Jasminum*)

*Jasminum*, *Dialeurodes kirkaldyi* on, in Florida, **209**; *Nausinoe geometralis* on, in China, **220** *Jatropha podagrica*, *Calidea dregii* on, in Ghana, **645**

Java, injurious Lepidoptera in, **177**; Pyralid pests of bamboo in, **178**; *Xyleborus* spp. in, **238**

*Javesella pellucida*, comparison of *Laodelphax striatella* and, as vectors of maize rough dwarf virus in Italy, **332**

Jeffrey Pine (see *Pinus jeffreyi*)

Jowan (see *Sorghum*)

Juan Fernandez Islands, *Liriomyza langei* misidentified as *L. bryoniae* in, **112**

*Juglans mandshurica*, *Gastrolina thoracica* on, in Soviet Union, **11**

*Juglans nigra*, *Eulecanium* spp. on, in Ontario, **204**

*Julodis onopordi*, attacking *Eucalyptus* in Spain, **256**

Juniper (see *Juniperus*)

*Juniperus*, *Argyresthia trifasciata* on, in Switzerland, **95**

*Juniperus procera*, control measures for, against *Oemida gahani*, in Kenya, **444**



Jute (see also *Corchorus*)  
Jute, pests of, in India, 316

## K

*Katothrips pisivorus*, combined control of *Con-  
tarinia pisi* and, on pea in France, 226

Kale, effects of soil applications of DDT and aldrin on, 231; varietal resistance to insect attack in, in Wisconsin, 275; damage to, by *Nysius huttoni* in New-Zealand, 313; persistence of dimethoate on, and aphids on, in U.S.A., 363; winged forms in *Brevicoryne brassicae* on, in Japan, 438; varietal resistance of, to *Phyllotreta striolata* in North Carolina, 524

*Kalotermes flavicollis*, control measures against, damaging trees and timber in Italy, 329; attractiveness to, of substances found in fungus-attacked wood; chemical decomposition of wood by, 406; effectiveness of contact insecticides in stored pine sapwood against, 408

Kamani, Ball (see *Calophyllum inophyllum*)

Kansas, predators of *Ostrinia nubilalis* on maize in, 274; *Acalymma vittatum* on cucurbits in, 343; *Therioaphis trifolii* on lucerne in, 366; *Heliothis zea* on sweet maize in, 486; holocyclic strain of *Therioaphis trifolii* on lucerne in, 493; resistance of wheat to *Mayetiola destructor* and *Toxoptera graminum* in, 496; comparative effectiveness of fumigants against stored product pests in, 542

Kaolin, as carrier for insecticides, 77; as carrier for malathion dust, 394

Karanda (see *Carissa carandas*)

Karbofos (see Malathion)

Karbolina (see DNC)

Kelthane (see Dicozol)

Kentucky, *Myzus persicae* on tobacco in, 166; *Bathyplectes curculionis* in, 168; *Pediasia* spp. damaging turf in, 269; survival tests of *Heliothis zea* and *Heliothis virescens* on tobacco and wheat-germ diet in, 413; control of *Hypera variabilis* on lucerne in, 493

Kenya, *Dermestes maculatus* infesting dried fish in, 82; control of insect pests of cotton in; weevils attacking tea nurseries in, 134; *Thrips nigropilosus* on *Chrysanthemum cinerariaefolium* in, 213; atlas of pests and diseases of coffee in, 239; *Anagyrus kivuensis* controlling *Planococcus kenyae* in, 242; protection of stored maize from insects in, 394; protection of maize stored in cribs in, 442; *Oemida gahani* attacking forest trees in; protection of timber from marine borers in, 444; migration of *Spodoptera exempta* in, 529; *Schistocerca gregaria* in, 597; *Dysdercus* spp. on cotton in, 624

Kepon (see Chlordecone)

*Kermania pistaciella*, bionomics of, on *Pistacia vera* in Iran and Turkey, 10

Kerosene, pyrethrum formulated in, 81, 82; for controlling *Cadra cautella* in stored grain, 477; as solvent for cashew extract, 615

Khorlophos (see Trichlorphon)

Kikuyu Grass (see *Pennisetum clandestinum*)

*Kochia scoparia*, survival of *Heterographis fulvobasella* on, 165

Kohlrabi, varietal resistance to insect attack in, in Wisconsin, 275

Korea, *Nephotettix cincticeps* in, 87; *Dendrolimus spectabilis* on pine in, 635

Krezotol (see DNC)

Kutra (mixture of toxaphene and DDT), in dusts against *Amsacta moorei*, 214

Kyllinga, *Bactra truculenta* on, in Hawaii, 175

Kyllinga pumila, *Athesapeuta cyperi* on, in Hawaii, 175

## L

Labiatae, *Chrysomela americana* on, in Italy, 331

*Labioproctus polei*, bionomics and control of, on orange in India, 262

*Labops hirtus*, development of *Leiothrips pallipes* in, in Ontario, 351

*Labrorychus prismaticus*, parasitising *Archips cerasivoranus* in Minnesota, 642

*Laccifer lacca*, *Butea monosperma* used in propagation of, 259; in India, 316

*Lachniella costata*, on spruce in Germany, 99

*Lachnosterna*, bionomics of species of, on sorghum and groundnuts in India, BHC against, 85; chemical treatment of conifer seedlings against, in Manitoba, 309

*Lachnosterna anxia*, association between *Caloglyphus* sp. and, in Nebraska, 343; sequential sampling for larvae of, in Manitoba, 346; dieltrid against, in cranberry bogs in Massachusetts, 586

*Lachnosterna bruneri*, on mahogany, litchi, citrus and peach in Florida, 47

*Lachnosterna consanguinea*, larvae of species near, on groundnuts and cereals in India, 85

*Lachnosterna cribrosa*, control measures against, on crops in Texas, 364

*Lachnosterna drakii*, sequential sampling for larvae of, in Manitoba, 346

*Lachnosterna nitida*, sequential sampling for larvae of, in Manitoba, 346

*Lachnosterna plaei*, attacking banana in Guadeloupe, 560

*Lachnosterna serrata*, bionomics of, in India, 259

*Lagenaria vulgaris*, *Epilachna chrysomelina* on, in Sicily, 609

*Lamachus*, parasitising *Neodiprion pratti pratti* in Virginia, 34

*Lambdina fiscellaria fiscellaria*, RNA changes in virus-infected tissue of, 572

*Lambdina fiscellaria lugubrosa*, susceptibility of, to viruses from other Lepidoptera, 18; on *Tsuga heterophylla* in Oregon, insecticides against, 42;

*Lambdina fiscellaria somnaria*, susceptibility of, to viruses from other Lepidoptera, 18

*Lamium album*, infected by *Ballota* split-leaf virus in Britain, 232

*Lampides boeticus*, on peas in Tunisia, 393

*Lampronota nitida*, parasitic in *Apamea basilinea* in Mongolia, 634

- Lamprophorus tenebrosus*, introduction and release of, against *Achalina fulica* in Hawaii, 174
- Lanners (see *Falco biarmicus*)
- Lantana*, *Endoclitia sericeus* on, in Java, 178
- Lantana camara*, biological control of, in South Africa, 129
- Laodelphax striatella*, collecting method of salivary sheath material of, 115; malathion resistance and susceptibility in, on rice in Japan, 150; relation between feeding behaviour and ovarian maturation of, on rice, 151; comparison of *Javesella pellucida* and, as vectors of maize rough dwarf virus in Italy, 332
- Laos, review of diseases and pests of economic plants in, 462
- Lapara confierarum*, thoracic temperature in, 64
- Larch (see also *Larix*)
- Larch, *Hylotrupes bajulus* on, 401, 402; *Zeiraphera diniana* on, in Europe, 520; *Coleophora loricella* on, in Sweden, 525; pests of, in Japan, Europe and Canada, 660
- Larch, Japanese (see *Larix leptolepis*)
- Larinus longirostris*, damaging *Carthamus tinctorius* in Israel, 636
- Larinus ovaliformis*, damaging *Carthamus tinctorius* in Israel, 636
- Larix dahurica*, damaged by *Coleophora dahurica* in Soviet Union, 189
- Larix decidua*, damaged by *Coleophora loricella* in Soviet Union, 189; *Aradus cinnamomeus* on, in Czechoslovakia, 454
- Larix laricina*, *Argyresthia loricella* on, in New Brunswick, 501
- Larix leptolepis*, pests of, in Japan, 660
- Larix sibirica*, damaged by *Coleophora sibirica* in Soviet Union, 189
- Lasioderma serricorne*, infesting stored dates in Israel, 143; effect of  $\gamma$ -radiation on, 252; dichlorvos against, in stored tobacco in Virginia, 354; tests with bromocyclen as protectant for stored wheat against, in Georgia, 364; enemies of, and infesting processed food bari in storage in India, 399; unusual records of, in British Columbia, 422; toxicity of fumigants to, 488; high-frequency electrical fields for control of, in stored wheat, 490; damaging stored organic material, 543; insecticides against, 583; insecticides against, 622
- Lasioseius*, on *Areca catechu* in India, 664
- Lasius niger*, effect of, on survival and dispersal of subterranean aphids in South Dakota, 292
- Latheticus oryzae*, in tests of toxicity of insecticides, 86; effects of temperature, humidity and light on development and mortality of, 254; fumigation against, in bagged wheat in India, 399
- Lathridius minutus*, effects of  $\gamma$ -radiation on, in Hungary, 324
- Lathyrus odoratus*, infected by virus disease of artichokes, 107; effects of temperature on transmission of virus to, by *Macrosiphum pisum*, 354
- Lathyrus pratensis*, parasitism of *Megoura viciae* on, in Czechoslovakia, 455
- Laurel (see *Laurus nobilis*)
- Lauric Acid, methyl esters of, inhibiting growth of *Gryllodes sigillatus*, 605
- N-(Lauryl Colaminofol mylmethyl)pyridinium Chloride, effects of, on deposits of DDT, 366
- Laurus nobilis*, *Trialeurodes lauri* on, in Soviet Union, 510
- Lavandula* spp., *Chrysomela americana* on, in Italy, 331
- Lawn (see Grasses)
- Lead, residues of, in apples and pears, 183
- Lead Arsenate, toxicity of, to *Cydia pomonella*, 75; in tests against *Cydia pomonella*, 93; residues of, in apples and pears, 183; in sprays against *Nola distributa*, 265; in sprays against apple pests, 360; toxicity of, in sprays, to predacious insects, 471
- Lead Nitrate, effects of, on deposits of DDT, 366
- Leafhoppers, comparison of methods for collection of, on lucerne in Massachusetts, 368; damaging maize in Soviet Union, 633
- Lebanon, *Ceroplastes rusci* on fig in, 98; question of migration of *Agrotis ipsilon* from Israel to, 101; *Tetranychus cinnabarinus* in citrus orchards in, 337; pests of apple in, 381; *Habrolepis fanari* sp.n., parasitising *Chrysomphalus ficus* in, 462
- Lebaycid (see Fenthion)
- Lebia analis*, predacious on eggs of *Heliothis zea* in Arkansas, 416
- Lecanium (see Coccus)
- Leek, *Diadromus* sp. parasitising *Acrolepis assectella* on, 182; *Rhopalosiphum maidis* on, in Bulgaria, 328; *Ocnogyna baetica* on, in Tunisia, 393
- Leguminivora glycinivorella*, bionomics and control of, on soy bean in China, 220; resistance of soy bean varieties to, in China, 221
- Leichenium canaliculatum variegatum*, in Florida, 543
- Leiophron pallipes*, bionomics of, in Mirid hosts in Ontario, 351; parasitising *Lygus* spp. in U.S.A., 583
- Lema*, parasites of, in Delaware, 368
- Lema armata*, bionomics and control of, on *Pennisetum* spp. in Africa, 606
- Lema bomaensis*, bionomics and control of, on *Pennisetum* spp. in Africa, 605
- Lema melanopa*, effects of X-rays on gametogenesis in, 65; tests of insecticides against, on oats in Michigan, 302; survival and development of larvae of, on species of graminaceous plants in Indiana, 307; resistance in cereals to, in Michigan, 582; insecticides against, 641; control measures against, attacking oats in Michigan, 642
- Lema planifrons*, bionomics and control of, on *Pennisetum* spp. in Africa, 606
- Lema tibialis*, bionomics and control of, on *Pennisetum* spp. in Africa, 606
- Lemon, *Toxoptera citricida* in relation to viruses of the *Citrus tristeza* complex of, 60; effect of sprays on, 207; yellow-shoot virus of, transmitted by *Toxoptera citricida*, 263; damage to, by insecticides, 269; *Eurytoma fellis* on, in New South Wales and Queensland, 314; *Aculus pelekassi* on, in Italy, 331; *Tetranychus cinnabarinus* on, in Lebanon, 337; *Aonidiella aurantii* on, in South Africa, 395;



- Prays citri* on, in Portugal, 461; laboratory rearing of *Aonidiella aurantii* on, 524; race of *Contarinia citri* damaging flowers of, in Sicily, 606; *Gymnoscelis pumilata* on, in Sicily, 608; *Cadra cautella* on, in Sicily, 609
- Lemon Peel, dimethyl 1-dimethyl-carbamoyl-1-propen-2-yl phosphate residues in, 240
- Lentil, damaged by *Contarinia lentis* in France, 226
- Lepidoptera, distribution of, on pine in Maryland, 304; control of, on crops in Italy, 390; list of parasites of, in Israel; associated with cocoa in West Africa, 620
- Lepidosaphes*, on *Citrus* in Somalia, 380
- Lepidosaphes beckii*, insecticides against, on *Citrus* in Italy, 94; on orange in Sicily and Sardinia, 95; sprays against, on *Citrus* in Florida, 207, 208
- Lepidosaphes cornutus*, infesting *Piper betle* in India, 318
- Lepidosaphes gloverii*, sprays against, on *Citrus* in Florida, 207
- Lepidosaphes ulmi*, sampling of populations of, on apple in Quebec, 179; bionomics of, on poplar in Spain, 256; infestation of, on insecticide-treated apple in Wisconsin, 279; on apple in Poland, 453
- Leptestheria*, attacking rice in Soviet Union, 140
- Leptinotarsa decemlineata*, on potato in Soviet Union, labelled with  $^{60}\text{Co}$ , *Perilloides bioculatus* predacious on, *Beauveria bassiana* against, 14; penetration and metabolism of  $^3\text{H}$  dimethoate in, 27; on potato in France, insecticides against, 52; effects of light on oviposition by, 58; effect of temperature on development of, on potato in Soviet Union, 89; on potato in Rumania, 91; *Aerobacter aerogenes* against, 109; parasitised by *Muscina stabulans* on potato in Soviet Union, 142; bionomics of, on potato in Bulgaria, 196; penetration and metabolism of endothon in, 228; comparison of DDT-susceptibility of populations of, from Central Europe, 340; control of, on potato in Italy, 390; entomogenous fungi isolated from, in Hungary; *Beauveria bassiana* for control of, in Czechoslovakia, 428; mode of action of *Beauveria bassiana* and DDT applied together against, in U.S.S.R., 432; effect of *Beauveria bassiana* alone or with DDT on fecundity and diapause of, 433; use of *Doryphorophaga doryphorae* in biological control of, on potato in France, 459; factors affecting efficiency of toxaphene against, on potato in Rumania, 461; toxicity of alcoholic analogue of chlordecone to, 507; *Lygus rugulipennis* destroying eggs of, in Soviet Union, 510; aerosols of chlorinated turpentine and  $\gamma$  BHC against, on potato in Poland, 514; *Beauveria* spp., alone or with DDT against, on potato in Bulgaria, 555; *Perilloides bioculatus* predacious on; food preferences of, 575; control of, damaging egg-plant in Soviet Union, 635
- Leptocoris* *acuta*, identification and distribution of, 527
- Leptocoris chinensis*, identification and distribution of, 527
- Leptocoris corbetti*, as synonym of *Leptocoris chinensis*, 527
- Leptocoris oratoria*, identification and distribution of, 527
- Leptocoris varicornis*, identification and distribution of, 527
- Leptomastix*, species of, parasitising *Nipaeococcus vastator* in India, 86
- Leptomoxotermes*, gen.n., in Ethiopia, 467
- Leptopterna dolabrata*, development of *Leio-phron pallipes* in, in Ontario, 351
- Leptoptilos crumeniferus*, as predator of *Nomadacris septemfasciata* in Tanganyika, 627
- Leptothrips* sp., as predator of *Panonychus citri* in Formosa, 315
- Leptozygaena gracilis*, *Thelyconychia vidua* from, for release against *Nacoleia octasema*, 177
- Leschenaultia leucophrys*, *Ecpanteria icasia* parasitised by, in Costa Rica, 645
- Lespedeza*, migration of *Anthonomus grandis* from, to cotton, 271
- Lethane 384 (see  $\beta$ -Butoxy  $\beta$ -Thiocyanodiethyl Ether)
- Lethrus jacobsoni*, bionomics, outbreak and control of, on vines in Soviet Union, 511
- Lettuce, *Frankliniella occidentalis* on, in New Mexico; in diet for *Melanoplus bivittatus*, 43; virus disease of, in California, 71; virus disease of, not infecting artichokes, 107; *Gryllotalpa gryllotalpa* reared on, 124; effects of soil applications of DDT and aldrin on, 231; dimethyl 1-dimethyl-carbamoyl-1-propen-2-yl phosphate residues in, 240; incidence of aster yellows in, as affected by placement of systemic insecticides against *Macrostelus fascifrons*, in New York, 285; *Pemphigus bursarius* on, in Britain, 335; pests of, in Texas, 367; residues of organophosphorus insecticides on, under glass in Germany, 518
- Leucania loreyi*, in India, 86
- DL-Leucine, attractiveness of, to *Eurytoma roddi*, 57
- Leucocyanidin, relation of *Pissodes strobi* to, in extracts of *Pinus strobus*, 452
- Leucopis americana*, preying on *Adelges piceae*, 502
- Leucopis obscura*, preying on *Adelges piceae*, 502
- Leucoptera coffeella*, insecticides in oil emulsion against, on coffee in Guatemala, 578
- Leucostoma simplex*, *Nabis* spp. parasitised by, in California, 583
- Levulose, effect of, on development of *Ceratitis capitata*, 244
- Libocedrus decurrens*, *Sirex aerolatus* infesting, in California, 68
- Ibaya, *Casama innotata* on *Acacia karroo* in, parasites of *Casama innotata* in, 51; *Schistocerca gregaria* in, 597
- Lichnanthe vulpina*, dielldrin against, in cranberry bogs in Massachusetts, 586
- Light, effects of, on *Trogoderma inclusum* and *Periplaneta americana*, 23; effects of, on oviposition by *Leptinotarsa decemlineata*, 58; effects of, on behaviour of Lepidoptera in response to sex pheromones, 61; effects of, on flight activity of *Hypera variabilis*, 63;

- effect of, for rearing *Diatraea saccharalis*, 65; effects of, on oviposition by *Sahlbergella singularis*, 109; use of, against fruit-piercing moths, 148; effect of, on *Eumerus strigatus*, 192; as ecological factor in life of insects, 239; effect of, on development of *Latheticus oryzae*, 254; effects of, on *Brevicoryne brassicae*, 332; effects of, on *Meligethes aeneus*, 384; effects of, on activity of *Tenebrio molitor*, 403; effects of, on mating and oviposition of *Diatraea saccharalis*, 411; effects of, on diapause in Lepidoptera, 434; effects of, on development of *Pieris napi* and *Pieris rapae*, 437; effects of, on infestation of stored wheat by *Ephestia* sp., 477; effects of, on mating in *Trichoplusia ni*, 538; reactions of *Trypodendron lineatum* to, 571; responses of *Trogoderma granarium* to, 601; effects of, on diapause of *Athalia glabricollis*, 632
- Light (see Ultraviolet Light)
- Light Microscopy (see Microscopy, Light)
- Light-traps, types of light for, for collecting Lepidoptera, 30; for *Nacoleia diemenalis*, 41; for Hemiptera, 42; for Lepidoptera, 45; separation of catches in, 55; automatic device for segregating insect catches in, 296; for *Manduca sexta*, 580; for *Empoasca fabae*, 582; for *Acrobasis vaccinii*, 583; used for assessing populations of injurious insects in orchards, 629; for forecasting oviposition of *Adoxophyes orana*, 654; for *Autographa gamma* and *Agrotis exclamationis*, 654; for *Cydia pomonella* and estimating insect populations, killing agent for use in, 661
- Lightning, affecting attractiveness of pine to *Dendroctonus brevicomis*, 541
- Lignin, effect of, on development of *Anobium punctatum*, 181; effect of termites on, in sapwood, 406
- Lilac, infested by *Caloptilia syringella* in Alberta, 649
- Lilac, Indian (see *Melia azedarach*)
- Lilies, Easter (see *Lilium longiflorum*)
- Lilies, *Polytela gloriosae* on, in India and Ceylon, 258
- Lilium longiflorum*, treatment of, against aphids in New Jersey, 160
- Lima Beans, persistence of dimethoate on, and aphids on, in U.S.A., 363; varietal resistance of, to *Epilachna varivestis* in North Carolina, 586
- Limbux (see Lime)
- Lime, *Toxoptera citricida* in relation to viruses of *Citrus tristeza* complex of, 60; with casein glue against *Enarmonia formosana*, 195; yellow-shoot virus of, transmitted by *Toxoptera citricida*, 263; influence of, on action of dieldrin against *Xyleborus fornicatus*, 441; *Eupulvinaria hydrangeae* on, 460
- Lime-sulphur, in sprays against Coccids, 328; in sprays for control of *Cecidophyopsis ribis* and black currant reversion, toxicity of, to black currant, in sprays against *Panonychus ulmi*, susceptibility of *Blepharidopterus angulatus* to spray programmes of, effect of, on *Typhlodromus pyri*, 470, 471
- Limnoria tripunctata*, protection of timber from, in East Africa, 444
- Limonene, affecting reproductive activity in *Schistocerca gregaria*, 605
- Limonium californicus*, sex attractants in extracts of, unfertilized females of, 204
- Limonium canus*, soil fumigants and organophosphorus insecticides against, on potato in Washington, 366
- Limonium dubitans*, susceptibility of, to insecticides in Ohio, 594
- Limothrips cerealium*, bionomics of, attacking cereal crops in Holland, *Aeolothrips intermedium* as predator of, 341; records of, infesting textiles in Germany, 521
- Limothrips denticornis*, on maize in Soviet Union, 13; measures against, on grasses in Germany, 101; bionomics of, attacking cereal crops in Holland, 341
- Linaria canadensis*, as early-season food-plant of *Heliothis* spp. in U.S.A., 539
- Lindane (see BHC)
- Lindingaspis rossi*, *Aphytis africanus* sp.n. reared from, on *Phoenix canariensis* in South Africa, 130
- Lindorus lophanthae*, use of, against *Aspidiotus destructor* on coconut in New Hebrides, 224
- Linoleic Acid, gas chromatography of, in *Hypera variabilis*, 413
- Linolenic Acid, gas chromatography of, in *Hypera variabilis*, 413; in diet for *Lymantria dispar*, 538
- Linseed Oil, in diets for *Pieris brassicae*, 448
- Liorhynchus hyalinus*, *Spanogonicus albofasciatus* predacious on, on cotton in Arizona, 417
- Lipari Is., use of *Opius concolor sicularis* against *Dacus oleae* in, 607
- Lipolexis gracilis*, parasitising *Toxoptera aurantii* in Italy, 103
- Liquidambar styraciflua*, infestation of, by *Strictoccephala militaris* in Georgia, 540
- Liriomyza*, sequential sampling plan for timing measures against, on tomato in Florida, 356; natural enemies of, on plants in Chile, 377
- Liriomyza brassicae*, insecticides against, on cotton in Texas, 278
- Liriomyza bryoniae*, on *Solanum dulcamara* in Azores, 112
- Liriomyza dianthi*, new synonym of *L. langei*, 115
- Liriomyza langei*, misidentified as *L. bryoniae*, 112; *L. dianthi* new synonym of, 115
- Liriomyza munda*, insecticides not destroying parasites of, in Florida, sprays against, 208; injury to tomato varieties by, in Texas, 272
- Liro-Insecticide S (see Carbaryl)
- Lissonota dubia*, parasitising *Eucosma tedella* and parasitised by *Mesochorus* sp., secondary hosts of in Germany, 564
- Lissorhoptrus oryzophilus*, factors affecting infestations of rice by larvae of, in Arkansas, 159; bionomics and control of, on rice in California, 161-162; control of, on irrigated rice in Louisiana, 282
- Litchi chinensis*, *Lachnosterna bruneri* on, in Florida, 47; *Aceria litchii* on, in East Pakistan, 145; *Argyroploce leucaspis* on, in India, 216;  $\gamma$ -radiation as quarantine treatment of, 284
- Lithocolletis blancardella*, on apple in Canada and U.S.A., 21; bionomics of, on apple in



- Soviet Union, 89; bionomics and parasites of, on apple in Rumania, 328; parasitism of, on apple in Italy, 330
- Lithocolletis corylifoliella*, parasitism of, on apple in Italy, 330; attacking fruit trees and hawthorn in Holland, 568
- Lithocolletis crataegella*, on apple in Canada and U.S.A., 21
- Lithocolletis ostensackenella*, on *Robinia pseudacacia* in U.S.A., 116
- Lithocolletis propinquella*, on *Prunus serotina* in Canada and U.S.A., 21
- Lithocolletis pyrifoliella*, damaging apples in Soviet Union, insecticides against, 195
- Lithocolletis robinella*, on *Robinia pseudacacia*, in U.S.A., 116
- Lithophane antennata*, damage to sour cherry by, in Wisconsin, 270; infestation of, on insecticide-treated apple in Wisconsin, 279
- Litsea chinensis*, *Zeuzera indica* on, 178
- Lixophaga diatraeae*, use of, in control of rice stem-borers in Philippines, 481
- Lixus algirus*, bionomics, parasitism, and control of, on broad bean in Sicily, 606
- Lixus juncii*, attacking beet in Spain, 246
- Lixus scabricollis*, bionomics and parasitism of, on beet in Spain, 246
- Lizards, attacking *Ecantheria icasia* in Costa Rica, 645
- Lobesia botrana*, control of, on vines in Malta, 135; control of, on vines in Soviet Union, 195; seasonal development of, on grapes in Bulgaria, 327
- Loblolly Pine (see *Pinus taeda*)
- Locust, Desert (see *Schistocerca gregaria*)
- Locusta migratoria*, physiological mechanisms of action of organophosphorus compounds on, 12; in Mauritius and Réunion, 111; experiments on the effect of photoperiod on sexual maturation of, 119; transmission of tumours in, by nucleic acid, 572; transport of fatty acids in, during flight, 620
- Locusta migratoria capito*, in Madagascar, 111
- Locusta migratoria manilensis*, long-term prediction of population fluctuations of, in China, 219; effect of environmental factors on hatching of, in China, 221; effects of temperature on reproduction in, in Soviet Union, 433
- Locusta migratoria migratoria*, in Soviet Union, ecology of, in relation to migration, 10; in Madagascar and Mali, 111; toxicity of analogues of dichlorvos, trichlorphon and naled to, 283; last outbreak of, in Africa, 400; partheno-genetic reproduction in, in Soviet Union, 433
- Locusta migratoria tibetensis*, in Tibet, 115
- Locustana pardalina*, convergence of swarms of, facilitating control in South Africa, 396
- Locusts (see also *Locusta*, *Schistocerca*)
- Locusts, periodicity of outbreaks of, 85; natural enemies of, 85, 112; control of, in Iran, 168; anatomy, physiology, development, phase polymorphism, and taxonomy of, 184; in Soviet Union, 196; long-term prediction of population fluctuations of, in China, 219; solitary phase of, and control of, in India, 316; on wheat in Iran, 519; radar in desert survey and control of, 597
- Lodgepole Pine (see *Pinus contorta*)
- Loganberry, *Eucosma uddmanniana* on, in Britain, 470
- Log Traps, against *Oryctes rhinoceros*, 313
- Lolium*, *Graphognathus leucoloma fecundus* on, in U.S.A., 32
- Lolium multiflorum*, damaged by barley yellow-dwarf virus in Czechoslovakia, 631
- Lolium perenne*, Thysanoptera on, in Germany, 101; Collembola in relation to injurious fungi on, in Holland, 383; *Melolontha melolontha* reared on leaves and stems of, in France, 460
- Lonchaea*, parasitised by *Ganaspis pelleranoi* in Brazil, 288
- Lonchaea furnissi*, associated with *Dendroctonus pseudotsugae* on Douglas fir in Washington and Oregon, 310
- Lonchaea pendula*, parasitised by *Ganaspis pelleranoi* in Brazil, 288
- Longitarsus parvulus*, on flax in Soviet Union, feeding preferences of, 12
- Longleaf Pine (see *Pinus palustris*)
- Lonicera tatarica*, infested by *Hyadaphis tataricae* in Germany, 239
- Loquat, *Dacus* spp. on, in India, 214; fruit-flies on, in Brazil, 241
- Lotis nigrifolia*, preying on *Aonidiella aurantii* and *Coccus hesperidum* in South Africa, 129
- Lotus corniculatus*, *Saissetia oleae* on, in Greece, 52
- Louisiana, crawfish reared in rice field in, 37; *Dalbulus maidis* and stunt virus of maize in, 70; *Diatraea saccharalis* on sugar-cane in, 165; *Heliothis* spp. on cotton in, 168; *Psara ipomoealis* on sweet potato in, 209; *Euzophera magnolialis* sp.n. attacking magnolia in, 210; diapause in *Heliothis* spp. in, 306; *Heliothis zea* in, 367; *Dendroctonus frontalis* on pine in, 370; control of *Atta texana* in, 492; parasitism of *Spodoptera frugiperda* in, 500; winter survival of *Diatraea saccharalis* in maize stalks in, 581; control of *Anthonomus grandis* on cotton in, 591
- Loxotropa tritoma*, attacking *Oscinella frit* in Britain, 467
- Lucerne (see also *Medicago sativa*)
- Lucerne, *Locusta migratoria migratoria* on, in Soviet Union, 11; *Macrosiphum pisum* on, in Minnesota, *Macrosiphum pisum* in relation to infection of, by *Phoma herbarum medicaginis*, 25; *Hypera variabilis* on, in New York, 36; *Lygus hesperus* on, in California, 37; *Megachile rotundata* as pollinator of, in Oregon, 38; *Frankliniella occidentalis* on, in New Mexico, 43; olfactory response of *Eurytoma roddi* to chemicals in, 57; harvesting of, in relation to migration of *Hypera variabilis*, 62; summer flight activity of *Hypera variabilis* in fields of, 63; *Agallia constricta* on, in Illinois, virus of, infecting vector, 70; *Spodoptera littoralis* on, 83; *Tychius flavus* on, in Rumania, 91; in relation to infestation of wheat by *Hylemya coarctata*, 105; virus disease of, not infecting artichokes, 107; *Melolontha melolontha* on, in France, 120; *Macrosiphum pisum* and *Therioaphis maculata* on, in Poland, 139; factors affecting decline in insecticide residues on, in Iowa and Manitoba, 156; *Hypera*

- variabilis* on, in Arkansas, 159; *Spissistilus festinus* on, 162; use of stems of, for rearing *Hypera variabilis*, 169; use of *Bombus* spp. for pollination of, 184; pests of, in Soviet Union, 196; *Salebria semirubella sanguinella* on, in Bulgaria, 198; virosis-like proliferation of, caused by *Aceria medicaginis* in Australia, 223; *Agriphila straminella* on, in Britain, 231; dimethyl 1-dimethyl-carbamoyl-1-propin-2-yl phosphate residues in, 240; *Matsumuraeses phaseoli* on, in China, 264; presence and persistence of insecticide residues on, in New York, 276; *Diabrotica undecimpunctata undecimpunctata* reared on, 285; *Empoasca fabae* on, in Wisconsin, 307; *Therioaphis trifolii* on, 308; beetles injurious to, in Turkmenia, *Mordellistena pumila* on, in Turkmenia, 324; resistance of Kansas clones of, to *Macrosiphum pisum* in Quebec, 347; parasites of *Macrosiphum pisum* on, in Ontario, 351; contamination of, with heptachlor and its epoxide, 360; *Hypera variabilis* on, in New York State, 362; evaluation of, for resistance to *Empoasca fabae* in Nebraska, 365; evaluation of, for resistance to *Therioaphis trifolii* in Kansas, 366; *Heliothis zea* on, in Louisiana, 367; *Ottiorhynchus ligustici* on, in New York, persistence of dieldrin on; comparison of methods for collecting insects on, in Massachusetts, 368; *Hypera variabilis* on, in Delaware and New Jersey, 369; disappearance of residues of dimethyl 1-dimethylcarbamoyl-1-propen-2-yl phosphate from, 370; *Liriomyza* sp. on, in Chile, 377; *Odontothrips confusus* damaging flowers of, in France, 390; *Collembola* injuring, in Tunisia, 393; attraction of *Hypera variabilis* to, in Maryland; effect of, on fatty acids in *Hypera variabilis*, 413; mechanism and sources of resistance to *Therioaphis trifolii* in, in Nebraska, 416; insecticide residues in milk following treatment of, in U.S.A., 418; insecticide residues in, following treatment against *Hypera variabilis* in Maryland, 419; gas-chromatographic measurement of toxaphene in, 464; holocyclic strain of *Therioaphis trifolii* on, in U.S.A.; *Hypera variabilis* on, in Kentucky, 493; thrips on, in Illinois; *Hypera variabilis* on, in Virginia, 497; *Contarinia medicaginis* on, in Poland, 512 *Carneocephala flaviceps* and virus disease of, in Florida, 543-545; *Collicularia microgrammana* on, in Bulgaria, 556; growing points of, attacked by *Cnephasia longana* in Holland, 568; *Hypera variabilis* on, in Iran, 570; *Hypera variabilis* on, in New York, 580; local flight habits of *Empoasca fabae* on, in Wisconsin, 582; natural enemies of *Lygus* spp. on, in U.S.A., 583; *Hypera variabilis* on, in Maryland, 594; *Sitona* spp. on, in Israel, 612; forecasting infestation by *Contarinia medicaginis* on, in Czechoslovakia, 631; *Macrosiphum pisum* on, in relation to predators, 646; *Macrosiphum pisum* on, in New Mexico, 647
- Lucerne Meal, in rearing medium for *Spodoptera littoralis*, 104; in diet for *Heliothis zea*, 170
- Lucerne Powder, in diet for *Hypera variabilis*, 285
- Lucerne Saponin, attractive to *Eurytoma rodii*, 57
- Lucerne Wax, attractive to *Eurytoma rodii*, 57
- Lupin (see *Lupinus*)
- Lupin, Yellow (see *Lupinus luteus*)
- Lupinus albus*, varietal resistance of, to *Macrosiphum pisum* in Poland, 511
- Lupinus angustifolius*, varietal resistance of, to *Macrosiphum pisum* in Poland, 611
- Lupinus luteus*, aphids on, 273; varietal resistance of, to *Macrosiphum pisum* in Poland, 511
- Lycium subglobosum*, *Ceratitis capitata* on, in Tunisia, 244
- Lycopersicum*, susceptibility of species and hybrids of, to infestation by *Tetranychus marianae* in Texas, 31; susceptibility of, to *Epitrix hirtipennis* and *Liriomyza munda* in Texas, 272
- Lycopersicum hirsutum*, susceptibility of, to infestation by *Tetranychus marianae* in Texas, 31
- Lycopersicum peruvianum*, susceptibility of, to infestation by *Tetranychus marianae* in Texas, 31
- Lycopus europaeus*, *Phrydiuchus* spp. on, 273
- Lyctus, treatment of wood against, in Germany, 456
- Lyctus brunneus*, behaviour and mining activity of larvae of, 403
- Lyctus linearis*, damaging parquet floors in Hungary, 402
- Lydella grisescens*, ecological and physiological adaptations of, 293; seasonal history and host synchronization of, in Minnesota, 305; parasitic in *Ostrinia nubilalis* in Minnesota, attractiveness of maize varieties for, 366
- Lygocerus*, species of, parasitising *Homalotylus flaminus*, 104
- Lygocerus frontalis*, as hyperparasite of aphids in Holland, 121
- Lygus*, *Spanogonicus albofasciatus* predacious on, on cotton in Arizona, 417
- Lygus elisus*, natural enemies of, on lucerne in U.S.A., 583
- Lygus hesperus*, traps for, method of marking, on lucerne and cotton in California, 37; malathion in sprays against, on cotton in Arizona, 171; damage to safflower plants by, in California; insecticides against, 276; natural enemies of, on lucerne in U.S.A., 583; systemic insecticides for control of, on cotton in Arizona, 595
- Lygus lineolaris*, migration studies of, light-traps for, 42; development of *Leiophron pallipes* in, in Ontario, 351; comparison of methods for collection of, on lucerne in Massachusetts, 368; control measures against, damaging strawberries in New York State, 496; natural enemies of, on lucerne in U.S.A., 583
- Lygus lucorum*, on cotton in China, 88
- Lygus pabulinus*, infected with beet crinkle virus, 657
- Lygus rugulipennis*, destroying eggs of *Leptinotarsa decemlineata* in Soviet Union, 510



- Lygus vosseleri*, chemical control of, on cotton in Uganda, 442
- Lymaenon marylandicus*, parasitising *Ollarianus strictus* on *Citrus* in Texas, 648
- Lymantria dispar*, on forest and fruit trees in Yugoslavia, polyhedrosis virus disease of; *Anastatus disparis* egg-parasite of, 7; comparative development of, on apple and currants in Poland, 9; physiological mechanisms of action of organophosphorus compounds on, 12; parasitised by *Anastatus disparis*, 136; rearing and fecundity of, in Soviet Union, 179; *Calosoma sycophanta* as predator of, in Spain; Microsporidia parasitizing, on *Quercus ilex* in Spain, 256; field techniques for assessing control of, on oak in New York State, 356; use of polyhedrosis virus against, on oak in Connecticut, 373; tests of bacterial strains against, on oak in Spain, 389; pathological complications during larval development of, in laboratory, 427; two strains of *Bacillus thuringiensis* isolated from larvae of, in Bulgaria, 428; tests with sodium arsenate and *Bacillus thuringiensis dendrolimus* against, 429; optimum times for spread of polyhedrosis in larvae of, on oak in Spain, 432; effects of freezing temperatures on, in Soviet Union, 434; effect of defoliation by, in New England, 463; insecticides and bacterial preparations against, on apple in Connecticut, 491; method for rearing, on artificial diet in Connecticut, 498; artificial diet for, 538; electroantennogram for measuring reception of odours by, 620; attraction of, to *d*-12-acetoxy-*cis*-9-octadecen-1-ol, 656; on larch in Japan, 660
- Lymantria monacha*, not attracted to *d*-12-acetoxy-*cis*-9-octadecen-1-ol, 656
- Lysiphlebus*, parasitising *Aphis fabae* in Poland, 97
- Lysiphlebus ambiguus*, parasitising aphids in Italy, 103
- Lythidathion, chemical definition of, 2; against *Lasioderma serricorne*, 583
- Lyta vesicatoria*, insecticides against, damaging olive trees in Sicily, 611

## M

- Macquartia chalconota*, parasitic in larvae of *Chrysomela americana*, in Italy, 331
- Macquartia dispar*, parasitic in larvae of *Chrysomela americana*, in Italy, 331
- Macquartia nitida*, parasitic in larvae of *Chrysomela americana*, in Italy, 331
- Macrocentrus*, for release against *Nacoleia octasema*, 177
- Macrocentrus homonae*, dieldrin against tea pests harmful to, in Ceylon, 446
- Macrocheles boudreauxi* sp.n., associated with *Ips* and *Dendroctonus* spp. in U.S.A., 571
- Macrophoma dalmatica*, relation between *Dacus oleae*, *Prolasioptera berlesiana* and spot disease caused by; control measures against, on olive in Israel, 637
- Macrosiphum ambrosiae*, tests of dusts for control of, on lettuce in Texas, 367

- Macrosiphum avenae*, specificity of transmission of barley yellow-dwarf virus to oats by, 69; development and reproduction of, on barley in Manitoba, 311; distribution maps of, 401; in herbicide-treated oat fields in New Brunswick, 424; effects of temperature on length of life and colour of progeny of, 567; transmission of barley yellow-dwarf virus by, to cereals in Czechoslovakia, 631
- Macrosiphum carthami*, toxicity of insecticides to, 85
- Macrosiphum dirhodum*, transmission of barley yellow-dwarf virus by, to cereals in Czechoslovakia, 631
- Macrosiphum euphorbiae*, on ornamental plants in Manitoba, parasite of, 24; occurrence of, on potato in South Africa, 130; infesting crucifers in Poland, 139; gut characters as means of determining origin of, in Britain, 335; transmission of pea enation mosaic virus by, in Germany, 381; on sugar beet and weeds in Britain, 384; reared on leaf disks for ecological studies, 451; efficiency of, in transmitting pea enation mosaic virus, 492
- Macrosiphum evansi*, reproduction of *Adalia bipunctata* reared on, 598
- Macrosiphum jacae*, transmitting tristeza virus of *Citrus* in India, 84
- Macrosiphum pisum*, on lucerne in Minnesota, in relation to *Phoma herbarum medicaginis*, 25; transmitting virus from cherry, 26; on peas, nutritional requirements of, 66; insecticides against, on broad bean, 81; on lucerne in Poland, parasitism of, by *Aphidius ervi*, 139; diet for rearing of, 179; clover yellow vein virus transmitted by, in Britain, 336; swallowing own saliva, 340; rearing of pure lines and mass cultures of, in Germany, 341; resistance of Kansas clones of lucerne to, in Quebec, 347; as food for laboratory-reared Coccinellid larvae in Canada, 348; *Aphidius smithi* and other parasites of, on leguminous plants in Ontario, 351; effects of temperature on biology of, and on transmission of virus to *Lathyrus odoratus*, 354; effects of chemosterilants on, 361; transmission of pea enation mosaic virus by, in Germany, 381; on beans in Czechoslovakia, 455; efficiency of, in transmitting pea enation mosaic virus, 492; parasitised by *Aphidius smithi* in U.S.A., 501; varietal resistance of lupins to, in Poland, 511; disulfoton against, on pea in Canada, 534; effectiveness of high pressure sprays against, 594; reproduction of *Adalia bipunctata* reared on, 598; factors affecting survival of predators of, 646; dissimilarities in bionomics of, on lucerne and peas in New Mexico, 647
- Macrosiphum sanborni*, as vector of broad bean mosaic virus in India, 259
- Macrosiphum solani*, systemic insecticides against, on *Lilium longiflorum* in New Jersey, 160; gut characters as means of determining origin of, in Britain, 335; on sugar beet and weeds in Britain, 384; *Coccinella septempunctata* reared on, 595
- Macrosteles fascifrons*, tissue culture of, 57; plant virus multiplication in, 115; parasitism of, by *Pachygonatopus minimus* in North

- America, 156; presumptive bacterial symbiont from eggs of, 239; insecticides against, for control of aster yellows on lettuce in New York, 285; *in vitro* cultivation of embryonic tissues of, 572; transmission of aster yellows virus by, 573
- Macrostelus laevis*, virus diseases of *Trifolium incarnatum* transmitted by, in Britain, 232
- Macrostelus viridigriseus*, virus diseases of *Trifolium incarnatum* transmitted by, in Britain, 232
- Macrotermes bellicosus*, attacking *Eucalyptus* in Uganda, 443
- Macrotermes natalensis*, attacking *Eucalyptus* in Uganda, 443
- Madagascar, list of parasites and predators in; locusts in, 111; *Diatraeophaga striatalis* for control of *Proceras sacchariphagus* on sugarcane in, 557; *Trichogramma australicum* parasitising *Proceras sacchariphagus* and *Corcyra cephalonica* in, 558; *Trichogramma* parasites of *Proceras sacchariphagus* on sugarcane, 630
- Magdalen Islands, *Adelges piceae* infesting balsam fir in, 502
- Magdalis perforata*, bionomics and ecology of, on pine in Canada and U.S.A., 20
- Magnesium Chloride, effects of, on deposits of DDT, 366
- Magnesium Sulphate, effect of, on *Tetranychus telarius*, 652
- Magnolia, Evergreen (see *Magnolia grandiflora*)
- Magnolia, Euzophera magnolialis* sp.n. on, in United States, 210
- Magnolia fraseri*, mortality of *Rhynacus breittlowi* on, 414
- Magnolia grandiflora*, *Trialeurodes lauri* on, in Soviet Union, 510
- Magnolia soulangeana*, mortality of *Rhynacus breittlowi* on, 414
- Magnolia virginiana*, *Trioza magnoliae* on, in Florida, 543
- Mahogany (see *Swietenia mahagoni*)
- Mahonia aquifolium*, *Eulecanium persicae* on, in Ontario, 203
- Maine, *Cephalcia fascipennis* on spruce in, 152; *Choristoneura fumiferana* parasitised by *Trichogramma minutum* in, 646
- Maize, *Tanyecus dilaticollis* on, in Yugoslavia, 6; pests of, in Soviet Union, 13, 16, 17; *Ostrinia nubilalis* in relation to infection of, by *Fusarium*, 17; *Ostrinia nubilalis* on, in U.S.A., factors affecting plant height and yield of, 35; *Hylemya trichodactyla* on, in Ontario, 43; factors governing storage of, in Nigeria, 50; in diets for *Diatraea saccharalis*, 65; *Dalbulus maidis* transmitting stunt virus of, in U.S.A., 70; Carabids on, in Rhodesia, 72; pests of, in Rhodesia, 74; *Melolontha melolontha* on, in China, 89; *Ostrinia nubilalis* on, in Rumania, 91; in relation to infestation of wheat by *Hylemya coarctata*, 105; varietal susceptibility of, to *Tribolium castaneum*, 115; *Hylemya fugax* associated with smut on, in Soviet Union, 141; *Ostrinia nubilalis* on, in Iowa, 162; varietal resistance of, to *Diabrotica longicornis* in Indiana, 163; *Diatraea saccharalis* on, in British Guiana, 172; attacked by *Mocis repanda* in Venezuela, 212; damaged by *Mylabris pustulata* and *M. phalerata* in India, 219; *Ostrinia nubilalis* and *Proceras venosatus* on, in China, 221; eradication of *Cirsium setosum* on, for control of *Agrotis ipsilon* on, in China, 264; residues on, from insecticides against *Ostrinia nubilalis* in Ontario, 267; in diet for *Diatraea saccharalis*, 268; migration of *Anthonomus grandis* from, to cotton, 271; dimethoate residues on, in Georgia, 273; predators of *Ostrinia nubilalis* on, in United States, 274; presence and persistence of insecticide residues on, in New York, 276; *Spodoptera frugiperda* and *Heliothis zea* on, in Georgia; insecticide residues on, 280; fat content in relation to insecticide contamination of seeds of, 281; *Diabrotica undecimpunctata undecimpunctata* reared on, 285; *Dalbulus maidis* and *Pergandus maidis* on, and virus diseases of, in Venezuela, 300; *Zea diatraea grandiosella* and *Ostrinia nubilalis* in, in Arkansas, 302; pests of, in India, 316; *Oligonychus indicus* and insecticide residues on, in India, 318; protection of, from pests in Soviet Union, 319; *Oscinella frit* on, in Ukraine, 323; *Javesella pellucida* and *Laodelphax striatella* in relation to rough dwarf virus in, in Italy, 332; *Chilo agamemnon* on, in Israel, 339; *Pseudaletia unipuncta* on, in Ontario, 350; *Zea diatraea grandiosella* on, in U.S.A., 360; attractiveness of varieties of, for *Lydeella grisescens*, *Ostrinia nubilalis* on, in Minnesota, 366; *Heliothis zea* on, in Louisiana, 367; *Otiorynchus ligustici* on, in New York, persistence of diethrin on; *Diabrotica virgifera* on, in U.S.A., 368; *Agrotis ipsilon* on, 370; chloropicrin residues in, after chamber fumigations, 375; pests of, in Somalia, 380; ground equipment for applying low-volume sprays to, 404; *Sitophilus* spp. in relation to, in U.S.A., 417; *Ostrinia nubilalis* on, in China, 439; *Chilo partellus* on, in India, 440; seed treatment of, attacked by termites in Tanganyika, 445; *Petrobia latens* on, in Queensland, 449; *Agrotis* spp. on, in Rumania, 461; Cicadellidae collected from, in U.S.A., 463; effects of insecticide treatment against pests of, in Egypt, 472, 473; *Chilo suppressalis* on, in Asia, 481; *Heliothis zea* on, in Kansas; *Diabrotica longicornis* on, in Wisconsin, 486; factors affecting resistance of, to *Heliothis zea* in California, 488; *Diabrotica longicornis* on, in Ohio, 491; *Ostrinia nubilalis* on, in Iowa, 492; role of 6-methoxybenzoxazolinone in resistance of, to *Ostrinia nubilalis*, 497; *Blissus leucopterus* on, in Ohio, 499; *Dalbulus maidis* on, in Georgia, 500, 501; *Chilo polychrysa* on, in Malaya, 527; feeding responses of Noctuid larvae to extracts of, 539; *Diabrotica* spp. on, in U.S.A., 543-545; *Pseudaletia unipuncta* on, in Soviet Union, 553; distribution of loss of yield in, and of infestations of *Busseola fusca* in Tanganyika, 577; winter survival of *Diatraea saccharalis* in stalks of, in Louisiana, 581; parasitism and predation of *Heliothis zea* on, in California, 582; losses caused by *Sitotroga cerealella* on, 585; biotypes of *Ostrinia nubilalis* on, in U.S.A., 587; *Sathro-*



- brota rileyi* in relation to *Sitophilus oryzae* and *Heliothis zea* damaging, in United States, 588; *Gymnoscelis pumilata* on, in Sicily, 608; seed treatment of, against wireworms in Soviet Union; *Oscinella* spp. and *Phyllotreta vittula* on, in Soviet Union; *Ostrinia nubilalis* migrating from millet to, 633; *Dalbulus* spp. and *Graminella nigrifrons* as vectors of stunt virus of, in United States; effect of plant nutrients on survival of *Ostrinia nubilalis* on, in Ohio, 644; development of *Heliothis zea* and *Spodoptera frugiperda* on, 649
- Maize (Stored), *Sitophilus* spp. and *Sitotroga* in, in Portugal, 387; measures against pests in, in Kenya, 394; dust for protection of, in cribs, against *Sitotroga cerealella* and Hymenopterous parasites in Kenya, 442
- Maize-cob Grits, in baits for *Pogonomyrmex occidentalis*, 486
- Maize Flour, productivity and development of *Tribolium* spp. on, 503
- Maize Meal, in diet for *Plodia interpunctella*, 34; in baits for *Rhynchophorus palmarum*, 42; in diets for *Tribolium*, 78; in bait for *Nematocerus sulcatus* and *Aperitmetus brunneus*, 135; *Lasioderma serricorne* recovered from bags of, 422
- Maize Semolina, in diet for *Corcyra cephalonica*, 558
- Maize Starch, malathion mixed with, 146; in diet for *Tribolium* spp., 503
- Maize, Sweet, Noctuids on, in Georgia, 361; bromide residues from methyl bromide fumigations of, 419
- Malacosoma americanum*, as food for laboratory-reared *Podisus maculiventris* in Quebec, 349
- Malacosoma disstria*, on *Populus tremuloides* in Minnesota, use of viruses against, 43; mortality due to *Bacillus thuringiensis* in, in Ontario, 352; susceptibility of young and old larvae of, to virus in Ontario, 371
- Malacosoma neustria*, defence reactions in, against *Merica ampelae* and virus disease, 123; parasites of, on *Quercus ilex* in Portugal, 295; *Telenomus terebrans* as egg-parasite of, on apple in Yugoslavia, 392; electron microscope observations of nuclear polyhedra from, 403; nuclear polyhedrosis viruses of, 526; *Bacillus thuringiensis* delaying death of virus-infected larvae of, 573
- Malacosoma pluviale*, in British Columbia, maternal influences on progeny quality of, 22; cloud patterns outlining climatic areas in population studies of, in British Columbia, 346
- Maladera (Serica)*, chemical treatment of conifer seedlings against, in Manitoba, 309
- Malaise Insect Traps, modifications in design of, 523-543
- Malafoxon, metabolism of, 114; contrasting susceptibility of *Dermestes* spp. to, triphenyl phosphate not affecting toxicity of, to *Dermestes maculatus*, 254; susceptibility of *Nephotettix cincticeps* to, 546
- Malathion, resistance to, in *Tribolium castaneum*, 3; susceptibility of *Sitophilus* spp. to, 4; against *Hoplocampa* spp., 9; against *Miccotrogus picirostris*, 29; and Panasol AN-5, against *Aphrophora saratogensis*, 36; against *Sitona cylindricollis*, 40; residues of, in rice bran; recovery of, from stored products; metabolism of, 56; toxicity of, to *Cydia pomonella*, 75; against stored-products pests, 77; effect of diluent on stability of, 78; flushing of mushrooms retarded by, against Diptera, 81; against *Macrosiphum pisum*, 82; and mineral oil, 98; effect of wheat-grain esterases on metabolism of, 114; not toxic to poultry, 116; effect of oil on persistence of, determined by bioassay of *Citrus* foliage, oil reducing toxicity of, to *Pauridia peregrina*; deposition of, on *Citrus*; aerial application of, against *Triops granarius*, 132; in sprays against *Icerya purchasi* and *Phthorimaea operculella*; affecting taste of wine, 135; in sprays against *Trioxa apicalis*; residues of, in plants, 137; and oil emulsion, against *Parlatoria blanchardii*, toxicity of, to *Pharoscyrmus numidicus*, 144; effect of particle size of grain on control of *Tribolium castaneum* by, 146; resistance and susceptibility to, in *Laodelphax striatella*, 150; toxicity of, to cyclodiene-susceptible and cyclodiene-resistant strains of *Hylemya antiqua*, 163; in sprays against *Toumeyella pinicola*, 164; in sprays against *Myzus persicae*, 167; cotton-insect control with low-volume concentrates of, applied by aircraft, 171; method for observing spray pattern of, 180; extraction of residues of, from fruits, 187; against *Lobesia botrana*, 195; and oil, effect of, on *Citrus*, in sprays against Coccids, 207; and oil emulsion, in sprays against Coccids, 208; and DDT, in sprays against *Acrobasis caryae*, 209; toxicity of, to *Heterotermes indicola*; toxicity of, on seeds for human consumption, 216; toxicity of, to *Tribolium castaneum* and *Sitophilus oryzae*, 217; susceptibility of grain beetles to, 225; not effective against *Enarmonia formosana*, 230; in sprays against *Plutella maculipennis*, 231; effect on successive generations of *Callosobruchus chinensis* treated with, 235; development of increased irritability to, in *Euxesta notata*, 236; disappearance of residues of, from gooseberries, 240; in dusts against *Oxycaenus hyalinipennis*, 243; contrasting susceptibilities of *Dermestes* spp. to, 253; triphenyl phosphate as synergist for, resistance to, in Diptera, 253; against *Tribolium* spp., 254; for protection of stored grain, against *Oryzaephilus surinamensis*, 255; against *Phyllocoptura oleivora*; in spray against *Neurotoma flaviventris*, 257; persistence on *Hibiscus* of spray residues of, against *Earias fabia*, 260; toxicity of, to *Sitophilus oryzae*; toxicity of, to *Tribolium castaneum*, 261; and adhesive, in sprays against *Labioproctus polei*, 263; in sprays against *Cheimophila salicella*, 267; contact versus stomach toxicity of, to *Spodoptera littoralis*, 269; low-volume sprays of, against *Anthonomus grandis*; contaminating rooms and equipment used for rearing *Cydia molesta*, swollen abdomens in *Cydia molesta* treated with, 275; in sprays,

- ineffective against *Macrosteles fascifrons*, 285; against aphids; in dusts, applied from aircraft, against *Rhagoletis pomonella*, 301; in sprays, against *Lema melanopa*, 302; against *Musgraveia sulciventris*, 314; toxicity of, to adults and larvae of *Dacus cucurbitae*, 316; toxicity of, to *Aonidiella aurantii*; *Bracon brevicornis* for bioassay of, 317; toxicity of, to *Oligonychus indicus*, 318; in sprays, against *Tettigella viridis*, 326; and parathion, in sprays, against *Heterarthrus ochropodus*, 331; resistance to, in *Tetranychus telarius*, 350; in sprays, against Dermestid larvae, effects of different surfaces on toxicity of, 353; in dusts against pests of stored maize, 394; in sprays against *Cydia leucostoma*; in sprays and dusts against, mist-blowing of, against *Scirtothrips bipinosus*, 397; soil treatment with, tolerance of larvae of *Sciopithes obscurus* to; and DDT, in sprays against *Trachyphloeus bifoveolatus*, 422; against aphids, 424; in dusts against *Galerucella birmanica*, 440; in sprays against *Echinonemus oryzae*, 411; tests of, in sprays against Coccids on papaya, 450; effectiveness of, against *Cydia funebrana*, 452; in sprays against *Bryobia praetiosa* 453; in sprays against *Cydia funebrana*, 453, 454; site of action of, in insects, 462; estimation of, by oxidation with chloramine-T, 464; and mineral oils, against Coccids, 473; against *Chilo auricilius*, 479; in oil emulsions, in sprays against *Stomacoccus platani*, 486; aerial application of, against *Hypera variabilis*, 493; in sprays against *Hypera variabilis*, 497; in sprays against *Blissus leucopterus*; in sprays against *Anthonomus grandis*, 499; residues of, on lettuce under glass, 518; atomisation of low-volume aerial spray of, 524; resistance to, in *Nephotettix cincticeps*; biochemical aspects of resistance to, in *Nephotettix cincticeps*, 545; comparative susceptibility of males and females of *Nephotettix cincticeps* to, 546; against *Lasioderma serricorne*, 583; in aerial sprays against *Anthonomus grandis*, 591; toxicity of concentrated sprays of, to locusts and grasshoppers, 593; and methoxy DDT, effect of spray volume and pressure on effectiveness of, against *Hypera variabilis* and *Macrosiphum pisum*, 594; and Isolan, against *Drosophila melanogaster*, 599; in sprays against pests of cowpea, 605; persistence of deposits of, used in sprays against stored-product beetles, 622; in aerosols and sprays against *Adelges nordmannianae*, 632; and protein-hydrolysate attractant, in sprays against *Dacus oleae*, 638; in dusts against *Phyrdenus muriceus*, 639; in sprays against *Bryobia rubrioculus*, 640; in sprays against *Lema melanopa*, 641; mite resistance to, 642; in sprays against *Ceratitidis capitata*, 643; development of resistance to, in *Psylla pyricola*, 643; in sprays against *Trioza tripunctata*, 649; against *Tetranychus telarius*, 662; for protection of stored potatoes from *Phthorimaea operculella*; in sprays against *Aleurolobus barodensis*, 664
- Malawi, rosette disease of groundnut in, 134; cotton spraying equipment in, 441, 442; outbreaks of *Pectinophora gossypiella* on cotton in; *Paurocephala gossypii* on cotton in, 475
- Malaya, *Nacoleia diemenalis* on cover crops for rubber in, 41; *Anonaepestis bengalella* on *Annona squamosa* in, 74; *Nephotettix apicalis* in, 87; survey of data of pests of *Hevea brasiliensis* in, 118; *Oryctes rhinoceros* on *Elaeis guineensis* in, 178; *Chilo polychrysa* in, 481, 482, 527, 528; *Rhabdionvirus oryctes* infecting *Oryctes rhinoceros* in, 536
- Malaysia, review of work on pests of rice in, 619
- Mali, locusts in, 111, 234, 597
- Maliarpha separatella, in Africa, 481, 482
- Malic Acid, as repellent to *Eurytoma roddi*, 57
- Mallophora ruficauda, natural enemy of *Cyclocephala signaticollis* in Argentina, 47
- Malopos (see Malathion)
- Malpighia glabra, y-radiation as quarantine treatment of, 284
- Malt, in baits for *Rhynchophorus palmarum*, 42
- Malta, insect pests of crop plants in, 135; *Cydia molesta* in, 333
- Maltose, attractive to *Eurytoma roddi*, 57; effect of, on pheromone production in *Ips confusus*, 409
- Malus (see Pyrus)
- Malva sylvestris, *Aphis gossypii* on, in France, 457; *Earias insulana* on, in Israel, 612
- Mamestra brassicae, viruses pathogenic to, 122; distribution of eggs of, on cabbage in Japan, egg parasites of; diapause in, in Japan, 148; polyhedrosis of, in Czechoslovakia, 431; combined use of parasites and micro-organisms in control of, on cabbage in Soviet Union, 432; varietal variations in resistance of brussels sprouts to, in Britain, 506; nuclear polyhedrosis viruses of, 526; population size of, on cabbage in Japan, 548
- Mammals, metabolic studies of cyclodiene insecticides in, 572
- Man, metabolism of carbaryl in, 404
- Manam (see Manganese dimethyldithiocarbamate)
- Mandarin, *Toxoptera citricida* in relation to viruses of *Citrus tristeza* complex of, 60; *Eurytoma fellis* on, in New South Wales and Queensland, 314; *Aculus pelekassi* on, in Italy, 331; insect-transmissible virus of, related to greening in South Africa, 396; *Cadra cautella* on, in Sicily, 609
- Manduca, *Protoparce* and *Phlegethontius* synonyms of, and *Sphinx carolina* type species of, 545
- Manduca quinquemaculata, induction of diapause in, 202; laboratory rearing of, in Ontario, 353
- Manduca sexta, studies on diapause of, in North Carolina, 306; virgin females increasing light-trap catches of males of, on tobacco in North Carolina, 580
- Maneb, and fenthion, effect of addition of spreader-adhesives on, in sprays against fruit-flies and fungus, 243
- Manganese (as plant nutrient), effect of, on fecundity of *Tetranychus telarius*, 274



- Manganese Dimethyldithiocarbamate, in sprays against *Venturia inaequalis* not harming beneficial mites and insects, 122
- Mango, *Dacus dorsalis* on, in Rota, 37; *Sternonchus mangiferae* on, in Hawaii, 173; *Dacus* spp. on, in India, 214;  $\gamma$ -radiation as quarantine treatment of, 284; Cecidomyiids infesting inflorescences of, in India, 477, 478
- Mangos (Stored), treatments of, against *Sternonchus mangiferae* in Hawaii, 173
- Manitoba, *Aphelinus semiflavus* parasitising aphids in, 25; *Cephalcia fascipennis* on spruce in, 152; *Pachygonatopus minimus* as parasite of *Macrosteles fascifrons* in; decline in insecticide residues on lucerne in, 156; chemical treatment of coniferous seedlings in, 309; food plants of *Rhopalosiphum fitchii* and *Rhopalosiphum padi* in; aphids on barley in, 311; sequential sampling for Lamellicorn larvae in, 346; *Aeroglyphus robustus* infesting stored grain in, 495
- Manoxol OT (see Sodium Dioctyl Sulphosuccinate)
- Maple, *Eupulvinaria hydrangeae* on, 460
- Mariana Is., *Dacus dorsalis* and its parasites in, 37
- Martesia striata, protection of timber from, in East Africa, 444
- Maruca testulalis, attacking beans in Tanganyika, 394; insecticides against, damaging cowpea in Nigeria, 605
- Maryland, *Tetranychus telarius* on rose in, 287; parasites and associated insects on pine infested by *Rhyacionia buoliana* in, 304; *Myzus persicae* on tobacco in, 355; Patasson conotracheli overwintering in eggs of *Hypera variabilis* in, 359; aphids on vegetables in, 363; *Hypera variabilis* attracted to lucerne in, 431; insecticide residues in lucerne and soil following treatment against *Hypera variabilis*, 419; *Macrosiphum pisum* parasitised by *Aphidius smithi* in, 501; control of *Hypera variabilis* on lucerne in, 594
- Mass Spectroscopy, identification of halogenated pesticides by, 404
- Massachusetts, insects on lucerne in, 368; *Acrobasis vaccinii* in, 583; dieldrin persistence in cranberry bogs following treatment against *Lichnanthe vulpina* and *Lachnosterna anxia* in, 586
- Mastirus aciculatus, parasitising *Neodiprion pratti* in Virginia, 34
- Matsucoccus resinosa, survival of, on cut logs of *Pinus resinosa* in United States, 179
- Matsumuraeses phaseoli, bionomics of, in China, 264
- Mattesia grandis, laboratory techniques for eliminating, from colonies of *Anthonomus grandis* in Mississippi, 363; pathogenicity of, to *Anthonomus grandis* in Mississippi, 372; affecting laboratory populations of *Anthonomus grandis*, 579; infection of *Anthonomus grandis* with, induced by feeding stimulant, 586; infection of *Bracon mellitor* by, 648
- Mauretania, *Schistocerca gregaria* in, 597
- Mauritius, locusts in, 111
- Mayetiola destructor, insecticides against, on hybrid wheat in Illinois, 163; larval response of, to simulated weather conditions, 487; resistance of wheat to, in Kansas, 496
- 6MBOA (see 6-Methoxybenzoxazolinone)
- MCPA (see 2-Methyl-4-chlorophenoxyacetic Acid)
- Mealybugs, and virus diseases of cacao, 572
- Meat, analytical method for insecticides in, 464
- Mecarbam, in drenches, against *Psila rosae*, 469
- Medeterra, abundance of, in relation to *Myelophilus piniperda* in Finland, 383
- Medeterra aldrichii, associated with *Dendroctonus pseudotsugae* on Douglas firs in Washington and Oregon, 310; method for rearing larvae of, in Oregon, 412
- Medicago sativa, pollination of, by bees in Czechoslovakia, 178
- Medicinal Plants, pests of, in India, 315
- Medlure, combined with trichlorophen in traps for *Ceratitis rosa* and *C. capitata*, 130
- Megachile brevis, pollinating groundnuts in Georgia, 45
- Megachile mendica, pollinating groundnuts in Georgia, 45
- Megachile rotundata, as pollinator of lucerne in Oregon, sex ratios in, 38
- Megachile texana, pollinating groundnuts in Georgia, 45
- Megalyra fascipennis, associated with *Phoracantha* spp. in South Africa, 131
- Megaselia halterata, on mushrooms, tests and uses of insecticides against, 81
- Megaselia rufipes, parasitising *Periclista dusmeti* on oak in Portugal, 295
- Megastigmus brevivulvus, parasitic in *Eurotyma fellis* in New South Wales and Queensland, 314
- Megastigmus piceae, on *Picea glauca* in Alaska, 21
- Megastigmus spermotrophus, insecticides against on *Pseudotsuga menziesii* in Washington State, 44
- Megastigmus strobilobius, bionomics of, infesting fir cones in Soviet Union, 437
- Megoura viciae, rearing of pure lines and mass cultures of, in Germany, 341; *Aphidius megourae* sp.n. parasitic in, in Czechoslovakia and Soviet Union, 455
- Meigenia mutabilis, parasitic in larvae of *Chrysomela americana*, in Italy, 331
- Melanogryllus desertus, damaging grape vines in France, 227
- Melanophila californica, use of x-rays to detect mortality of, in pine bark in California, 596
- Melanophila consputa, mating and oviposition habits of, on pine in California, 69
- Melanoplus bivittatus, dietary requirements of, 43; schizogregarine infection in, in Alberta, 572
- Melanoplus sanguinipes, field population of, in Ontario, parasites of, 179; effect of soil, moisture and type on oviposition by, 205; schizogregarine infection in, in Alberta, 572
- Melanostoma mellinum, outbreak of entomophthoraceous fungi, on in Switzerland, 428
- Melanotus communis, damaging potato in Quebec, 157
- Melanotus fissilis, damaging potato in Quebec, 157

- Melasoma interruptum*, on willow, poplar and alder in Florida, 543-545
- Melasoma lineatopunctatum*, on willow, poplar and alder in Florida, 543-545
- Melia azedarach*, insecticidal properties of drupes of, against *Pieris brassicae* in India, 218; *Trialeurodes lauri* on, in Soviet Union, 510
- Melichares tarsalis*, feeding on eggs on *Ephestia kuehniella*; effect of, on epizootics of *Bacillus*, 50
- Meligethes aeneus*, parasites of, on rape in Sweden, 182; studies on light reactions of, in Finland, 384; effect of control measures on parasites of, on rape in Germany, 618
- Melilotus*, *Sitona cylindricollis* on, in Alberta, 40; *Matsumuraes phaseoli* on, in China, 264; *Therioaphis riehmii* on species of, 308; coumarin content in, in relation to damage caused by *Empoasca fabae*, 498
- Melilotus alba*, damaged by *Empoasca fabae* in Nebraska, 498
- Melilotus officinalis*, damaged by *Empoasca fabae* in Nebraska, 498
- Melissa officinalis*, *Phrydiuchus* spp. on, 273
- Melolontha*, BHC against, in forests in Germany, 517
- Melolontha hippocastani*, *Filipjevimermis polozenvei* parasitising, in Soviet Union, 115; relation of temperature to flight and egg maturation of, in Germany, 518; sexually controlled differences in susceptibility of, to insecticides, 565
- Melolontha melolontha*, bionomics of, on cereals, vegetables and forest trees in China, 89; cytoplasmic virus disease of, 105; laboratory rearing of, 107; measures against, on lucerne and grassland in France, 120; climate and larval habitat of, in Yugoslavia, 392; milky disease of, in France; microsporidiosis caused by *Nosema melolonthae* in larvae of, in France, 427; species of bacteria isolated from, in Switzerland, 430; leaves and stems as food for larvae of, in France, 460; relation of temperature to flight and egg maturation of, in Germany, 518; insecticides against, damaging maize in Soviet Union, 633
- Melon, aphids in relation to virus disease of, *Aphis gossypii* on, in France, 457; *Epilachna chrysomelina* on, in Sicily, 609
- Melon, Cantaloup, honey bees as pollinators of, in Arizona, 38
- Menazon, against aphids; effects of, on soil fauna; persistence of, in soil, 80; in seed dressings and sprays against *Aphis craccivora*, 133; against aphids, 230; seed treatment with, in sprays and dusts, tests of, against *Aphis fabae*, 321; in sprays and soil treatment with, in granules against aphids, 469; against *Rhopalosiphum padi*, volatility and ability of, to move through soil, in relation to absorption of, by wheat, 532; in sprays against *Cavariella aegopodii*, 533; method for assessing effect of, used in sprays against aphids, on fauna of fruit trees, 629
- Menderong (see *Scirpus grossus*)
- Menochilus sexmaculatus undulatus*, predacious; on *Aphis sacchari* and *Aphis indosacchari* in India, 479
- Mentha*, virus disease of *Rachiplusia ou* on, in Indiana, 535
- N - (Mercaptomethyl) - phthalimide - carbonyl - C<sup>14</sup> - S - (O, O - dimethylphosphorodithioate), metabolism of, in rat, 464
- Mercaptothion (see Malathion)
- Mericia ampelus*, defence reactions in *Mala-cosoma neustria* against, 123
- Merkaptofos (see Demeton)
- Mermis subnigrescens*, parasitising grasshoppers in Quebec, 157
- Mesagroicus manifestus*, control measures against, on lucerne in Turkmenia, 323
- Mespamea secalis*, on maize in Soviet Union, 13
- Mesochorus*, as hyperparasite attacking *Lissonota dubia* in Germany, 564
- Mesoleius*, parasitising *Pristiphora erichsonii* in Japan, 660
- Mesoleurus dentipes*, bionomics of; on maize, sunn hemp, soy bean and groundnuts in Rhodesia; DDT against, other measures against, 74
- Mesopolobus morys*, attacking *Ceutorhynchus assimilis* on rape in Sweden, 182
- Mesopolobus verditer*, parasitic in larvae of *Enarmonia ratzeburgiana* in Quebec, 349
- Mesosa myops*, infesting elms in Soviet Union, 143
- Mesuroil (see Methiocarb)
- Metacil (see Aminocarb)
- Metagonistylum minense*, *Diatraea saccharalis* parasitised by, in British Guiana, 172
- Metaisoxystox (see Methyl-demeton-S)
- Metaphoxide (see Metepa)
- Metarchon, definition and use of in pest control, 288
- Metarrhizium anisopliae*, infesting *Vitacea polistiformis* on vines in Missouri, 160; infesting Lamellicorn larvae in New Zealand; use of, in control of *Oryctes rhinoceros* in Samoa, 313
- Metasystox (see Methyl-demeton)
- Metasystox i (see Methyl-demeton-S)
- Meta-Systox-R (see Oxydemeton-methyl)
- Metasystox R-50 (see Oxydemeton-methyl)
- Meteorus*, determination of, in *Spodoptera frugiperda*, in Louisiana, 500
- Meteorus laphygmae*, parasitising *Pseudaletia unipuncta* in Hawaii, 175
- Meteorus trachynotus*, parasitising *Choristoneura fumiferana* on *Abies balsamea* in Quebec, 152; parasitising *Evora hemidesma* in Iowa, 410
- Meteorus versicolor*, parasitising *Abraxas pantaria* on ash in Portugal, parasitising *Thaumetopoea pityocampa* on pine in Portugal, 295
- Metepa, as chemosterilant for *Pectinophora gossypiella*, 35; as chemosterilant for *Ceratitis capitata*, 51; as chemosterilant for *Dacus oleae*, 52; and apholate, as chemosterilant for *Callosobruchus chinensis*, 148; effect of, on *Trichoplusia ni*, 278; effect of, on *Diabrotica balteata*, 279; effects of, as chemosterilant for *Macrosiphum pisum*, 361; effects of, as sterlant for *Popillia japonica*, 364; as



- chemosterilant for *Dendrolimus spectabilis*, 635
- Methanol, as solvent for constituents of cotton bud, 281; use of, in extractions of rice bran, 548
- Methanol-acetone, use of, in extraction of malathion residues from fruits, 187
- Methidathion, chemical definition of, 2; seed treatments with, against *Lissorhoptrus oryzophilus*, 161; guide to, 297; in sprays against *Argyrotaenia velutinana*, persistence of, on grape foliage, 358; against *Hypera variabilis*, 580
- Methiocarb, chemical definition of, 2; against *Panonychus ulmi*, 26; toxicity of, to *Distantiella theobroma*, 72; against *Tetranychus telarius*, 164; in sprays against *Conotrachelus nenuphar*, 165; in sprays against *Acrobasis caryae*, 209; effects of, on pests of peach, 352; in drenches, granules and seed treatment with, against *Hylemya antiqua*, 356; in sprays against *Argyrotaenia velutinana*, persistence of, on grape foliage, 358; against *Panonychus ulmi*, 369; effective against resistant and susceptible strains of *Tetranychus telarius*, ineffective against *Panonychus ulmi*, 379; in sprays against *Scirtothrips bispinosus*, 397; in dusts and sprays, against *Trialeurodes floridensis*, 416; in control of *Cydia pomonella*, 448; in sprays against *Petrobia latens*, 449; in sprays against *Diparopsis watersi*, 656
- Methionine Sulphoxide, effect of, in diet for larvae of *Ctenicera destructor*, 624
- Methotrexate, effect of, on *Anthonomus grandis*, 277
- 6-Methoxybenzoxazolinone, role of, in resistance of maize to *Ostrinia nubilalis*, 497
- Methoxychlor (see Methoxy-DDT)
- Methoxy-DDT, against *Miccotrogus picrostris*, 29; toxicity of, to *Spodoptera littoralis*, 84; aerial application of, against *Hypera variabilis*, 493; in sprays against *Rhagoletis cerasi*, 514; and malathion, effect of spray volume and pressure on effectiveness of, against *Hypera variabilis* and *Macrosiphum pisum*, 594; persistence of deposits of, used in sprays against stored-product beetles, 622; effect of, on blood cells of *Periplaneta americana*, *Poecilocus pictus* and *Samia cynthia ricini*, 662
- Methyl Bromide, uses of, against pests of stored sorghum, 82; toxicity of, to *Aonidiella aurantii*, 85; design and construction of fumigation chambers using, 116; as fumigant against *Sternonchetus mangiferae*, 173; as fumigant, tolerance of vegetables to, 180; as fumigant against stored-grain mites, 200; and ethylene dibromide, as fumigant, against insect infestation in foodstuffs, 215; as fumigant, residues of, in chicken tissues and eggs, 240; as fumigant, effect of vapour pressure of, on mortality of stored product insects in vacuum fumigation, residual vapours in insects fumigated with, 253; as fumigant, against *Phthorimaea operculella* in stored potatoes, 264; as fumigant, not successful against *Eurytoma fellis*, 314; as fumigant, against *Epichorista ionephela*, 345; as fumigant ineffective against *Ephestia elutella* in stored tobacco, 355; as fumigant, against *Sitophilus granarius*, 372; effects of, as fumigant for cardamom, 398; diffusion of, into pine wood during fumigation against *Hylotrupes bajulus*, 402; residues of, after fumigation of cacao beans, fruits and vegetables, 419; as fumigant, against *Oemida gahani* in timber, 444; as fumigant, against pests of stored products, 488; review of properties and usage of, as fumigant, 504; as fumigant, for fruits infested by *Hyphantria cunea*, 510; as fumigant, susceptibility of development stages of *Sitophilus granarius* to, 600
- O-Methyl O-4-Bromo-2,5-dichlorophenyl Phosphorothioate, as metabolite of bromophos, 600
- Methyl-n-butyrate, hydrolase activity of *Nephotettix cincticeps* and, 546
- 2-Methylcarbamoyloxyimino-1,3-dithiolane, synthesis of, 186; toxicity of, to rats, 186
- Methyl-carbophenothion, against *Tetranychus telarius*, 164; against *Tribolium* spp., 254
- 2-Methyl-4-chlorophenoxyacetic Acid, effects of, on soil arthropods, 75; not affecting cattle fed treated forages, 187
- N-(2-methyl-4-chlorophenyl)-N',N'-dimethylformamidine, alone and with dichlorvos, toxicity of vapours of, to *Tetranychus cinnabarinus*, 584, 585
- 6-Methyl-3-cyclohexene-1-carboxylic Acid, esters of, combined with toxicant in traps for *Ceratitis rosa* and *C. capitata*, 129
- Methyl-demeton, against *Hoplocampa* spp., 9; effects of, on bees, 10; and parathion, against pests of stone fruit, 122; reducing spread of leafroll by *Myzus persicae*, 131; as drench against *Macrosiphum solani*, 160; in sprays against *Myzus persicae*, 166; against *Liriomyza munda*, not harmful to parasites of *Liriomyza munda*, 208; and DDT, in sprays against *Thrips nigropilosus* and *Tetranychus ludeni*, 213; in sprays against *Tetranychus telarius*, 232, 247; phytotoxicity of, to seeds and plants, 263; against aphids, 301; against *Aphis fabae*, 321; against *Helopeltis theivora*, 397; in sprays against *Bryobia praetiosa*, 453; in sprays against *Panonychus ulmi*, susceptibility of *Blepharidopterus angulatus* to spray programmes of, effect of, on *Typhlodromus pyri*, 470; toxicity of, in sprays, to predaceous insects, 471; in sprays against mites on vines, 509; resistance to, in *Tetranychus telarius*, 515; resistance to, in *Dasyneura pyri*, 515; in sprays against *Caviariella aegopodii*, 533; in sprays against *Bryobia rubrioculus*, 640
- Methyl-demeton-O, against aphids, 118; resistance to, in *Myzus persicae*, 650
- Methyl-demeton-R (see Oxydemeton-methyl)
- Methyl-demeton-S, against *Hoplocampa* spp., 9; effect of, on properties of cotton, 441; and carbaryl, effect of, in combined sprays against cotton worms and spider mites, 474
- Methyl 2,2-Dichlorovinyl Phenylphosphonate, toxicity of, to agricultural insects, 283; toxicity and anticholinesterase activity of, to *Ceratitis capitata*, 292

- Methyl 2,2-Dichlorovinyl 2-Thienylphosphonate, toxicity of, to agricultural insects, **283**; mouse toxicity and anticholinesterase activity of, to *Ceratitis capitata*, **292**
- N-Methyl (O,O-Diethyldithiophosphoryl)-5-thia-3-methyl-2-valeramide (see O,O-Diethyl S-2-(1-methylcarbamoylthio)ethyl Phosphorodithioate)
- N-Methyl (O,O-Diethyldithiophosphoryl)-5-thia-3-valeramide (see O,O-Diethyl S-2-(methylcarbamoylmethylthio)ethyl Phosphorodithioate)
- 3-Methyl-4-dimethylaminophenyl N-Methylcarbamate (see Aminocarb)
- O-Methyl S,S-Dipropyl Phosphorodithioate, (as fumigant) against pests of stored products, **488**
- Methyl Dodecyl Benzyl Trimethyl Ammonium Chloride, effects of, on deposits of DDT, **366**
- N-Methylenefluoroacetamides, insecticidal activities of derivatives of, against aphids, mites and mammals, substituted, in tests against *Aphis fabae*, **114**
- Methyl Eugenol, as bait for *Dacus dorsalis*, **37**
- $\alpha$ -Methylglutamic Acid, effect of, in diet for larvae of *Ctenicera destructor*, **624**
- Methyl p-Hydroxybenzoate, against fungi in insect cultures, **65**; in rearing medium for *Spodoptera littoralis*, **104**; in diet for *Ips calligraphus*, **209**; in diet for *Diatraea saccharalis*, **268**; apholate administered to *Dacus oleae* in, **578**
- Methyl Mercury Dicyandiamide, toxicity of, to *Procambarus clarkii*, **37**
- Methyl 2-(1-Methyl-n-heptyl)-4,6-dinitrophenyl Carbonate (see Dinocron)
- S-Methyl 2-(1-Methyl-n-heptyl)-4,6-dinitrophenyl Thiocarbonate (see Dinosulfon)
- 2-Methyl-2-(methylthio)propionaldehyde O-(Methylcarbamoyl)oxime, against *Hypera variabilis*, **36**; soil treatment with, in granules against *Paratiroza cockerelli* and *Myzus persicae*, **268**; against cotton pests, **278**; in drenches, granules, seed treatment with, against *Hylemya antiqua*, **356**; effect of, against *Tetranychus telarius* on roses, **358**; guide to, **452**; toxicity of, to *Hylemya brassicae*, **493**; seed treatment with, in granules against cotton pests, **589**; soil treatment with, in granules against *Lygus hesperus*, **595**; with pre-emergence herbicides, effect of, on cotton seedlings, **596**; phytotoxicity of, against *Psylla pyricola*, **643**
- O-Methyl O-p-Methylthiophenyl Methyl-phosphonothioate, and related compounds, labelled with  $^{32}\text{P}$ , metabolism of, in cotton, toxicity of, to pests of cotton, **357**
- 6-Methyl-2-oxo-1,3-dithiol[4,5-b]-quinoxaline (see Quinomethionate)
- Methyl Palmitate, effect of, on development of *Gryllosides sigillatus*, **605**
- Methyl Paraben, in diets for insects, **34**
- Methyl-parathion, against *Hoplocampa* spp., **9**; toxicity of, to *Procambarus clarkii*, **37**; against *Heliothis zea*, **45**; rhythm of susceptibility of *Anthonomus grandis* to, **71**; residues of, in plants, **137**; and endrin, in sprays against cotton pests, **166**; and parathion, against *Lithocolletis pyrifoliella*, **195**; in sprays against *Typhlocyba rosae*, **197**; in dusts against *Chaetocnema* spp., **198**; not effective against *Liriomyza munda*, **208**; in sprays against cotton pests, **215**; in sprays against *Zeuzera pyrina*, **228**; development of increased irritability to, in *Euxesta notata*, **236**; in sprays applied to irrigated rice not affecting *Procambarus clarkii*, **282**; toxicity of, to adults of *Dacus cucurbitae*, **316**; toxicity of, to *Aonidiella aurantii*, **317**; in dusts, against *Oscinella frit*, **323**; in sprays, against *Tettigella viridis*, **326**; against aphids on *Prunus mahaleb*, **327**; against *Spodoptera littoralis*, **357**; susceptibility of *Heliothis zea* to, **369**; phytotoxicity of, to oranges, in sprays against *Aonidiella aurantii*, **393**; effectiveness of, against *Cydia funebrana*, **452**; in sprays against *Bryobia praetiosa*, **453**; residues of, in plants, used against *Tetranychus telarius*, **461**; persistence of residues of, on sunflower seeds, **464**; in sprays against *Anthonomus grandis*, **499**; in sprays against Aleyrodids, **510**; applied from aircraft, in sprays and dusts against *Eurygaster integriceps*, **549**; in sprays against *Pegomya betae*, **551**; and DDT, in dusts against *Eurygaster integriceps*, **554**; in sprays against *Phyllotreta cruciferae*, **555**; applied in dusts, sexually controlled differences in susceptibility of *Otiorynchus niger* to, **565**; and oils, in sprays against *Leucoptera coffeella*, **578**; in sprays against *Anthonomus grandis*, **580**; in aerial sprays against *Anthonomus grandis*, **591**; in sprays against *Ancylics comptana*, **617**; in dusts against *Phyrdenus muriceus*, **639**; in sprays against *Hypocala andremona*, **639**
- 6-Methylquinoxaline-2,3-dithiocarbonate (see Quinomethionate)
- 6-Methyl-2,3-quinoxalinedithiol Cyclic Carbonate (see Quinomethionate)
- 6-Methyl-2-thiouracil, effect of, on *Anthonomus grandis*, **277**
- 4-Methylthio-3,5-xylyl N-Methylcarbamate (see Methiocarb)
- Methyl 2,4,5-Trichlorophenyl Phosphoramidates, synthesis and insecticidal activity of, **188**
- Methyl Trithion (see Methylcarbophenothion)
- M-Methylthiophenyl Methylcarbamate, against *Musca domestica*, **373**
- Methylene Chloride, as solvent for sex attractant of *Pectinophora gossypiella*, **500**
- Methylene-chloride Extract, in traps for *Pectinophora gossypiella*, **589**
- Metilmerkaptosfos (see Methyl-demeton)
- Metoponorthus pruinosus*, chemical control of, invading houses in Germany, **564**
- Metox (see Methoxy-DDT)
- Mevinphos, against larvae of *Zeuzera pyrina*, **5**; effects of, on bioassay of Bidrin, **28**; against aphids, toxicity of, to *Coccinella septempunctata*, **85**; in sprays against *Trioza apicalis*, **136**; persistence of residues of, **137**; and endrin, in sprays against *Myzus persicae* and *Aphis gossypii*, **146**; ineffective in sprays against *Tetranychus telarius*, **164**; in sprays against *Spodoptera litura*, **223**; in sprays against *Zeuzera pyrina*, **227**; in sprays against *Plutella maculipennis*, **231**; phytotoxicity of,



- to seeds and plants, **263**; in sprays against *Chemophila salicella*, **267**; against *Musgraveia sulciventris*, **314**; toxicity of, to *Aonidiella aurantii*, **317**; residue analysis and screening of, by gel diffusion, **465**; toxicity of, in sprays, to predacious insects, **471**; in sprays against *Heliothis zea*, **486**; in sprays against *Dasyneura pyri*, **515**; residues of, on lettuce under glass, **518**; and Isolan, against *Drosophila melanogaster*, **599**; development of resistance to, in *Psylla pyricola*, **643**
- Mexico, *Aleurocanthus woglumi* in, **172**; *Ips* spp. in, **205**; *Hypopta agavis* on *Agave* in, **409**; effect of biotin on *Anastrepha ludens* in, **413**; tepa against *Anastrepha ludens* in, **499**; attempted control of *Pectinophora gossypiella* by male annihilation on cotton in, **589**; *Spodoptera ornithogalli* in, **617**; current problems in study of entomology in, **619**; *Ceratitis capitata* in, **643**
- MGK 264 (see N-(2-Ethylhexyl)bicyclo-[2.2.1]-5-heptene-2,3-dicarboximide)
- Miccotrogus picrostris*, insecticides against, on white clover in U.S.A., **29**
- Mice, toxicity of insecticides to, **114**; insecticides toxic to, **186**; toxicity and metabolism of O,O-dimethyl O-p-dimethyl-sulphamoyl-phenyl phosphorothioate in; effect of thiono substituent on toxicity of fluorophosphates to, **188**; metabolism, storage and excretion of endosulfan in, **488**; nuclear-polyhedrosis virus of *Trichoplusia ni* found harmless to, **536**; Michigan, *Rhagoletis pomonella* on blueberry in, **301**; *Lema melanopa* on oats in, **302**; *Rhagoletis pomonella* in, **352**; *Neodiprion sertifer* on pine in, **543**; *Lema melanopa* on cereals in, **582**; measures against *Lema melanopa* attacking oats in; mites on apple in, **642**
- Microgaster*, reclassification of, **55**
- Microlarinus lareynii*, parasites of, feeding on *Tribulus terrestris*, **170**; *Microlarinus lypriformis*, parasites of, feeding on *Tribulus terrestris*, **170**
- Micronesia, *Nephotettix apicalis* in, **87**; Chalcidoidea of, **180**; Mycetophilids of, **523**; insects of, **620**
- Microphthalma europaea*, parasitising Scarabaeid larvae in Algeria, **105**
- Microplitis croceipes*, parasitising *Heliothis* spp. in U.S.A., **539**
- Microscopy, Electron, of rice dwarf virus in *Nephotettix cincticeps*, **180**; of nuclear polyhedra from *Malacosoma neustria*, **403**; of viruses in *Hyphantria cunea*, **431**
- Microscopy, Light, of virogenic stromata of cytopolyhedroses of Lepidoptera, **572**
- Microsporidia, *Pseudaletia unipuncta* attacked by, in Hawaii, **175**
- Microtermes*, attacking ground-nut in India, **216**; attacking *Eucalyptus* in Uganda, **443**; distribution of, in Nigeria, **467**
- Microtermes albobartitus*, infestation and control of, on crops in Tanganyika, **445**
- Microtermes redenianus*, infestation and control of, on crops in Tanganyika, **445**
- Microterys amamensis*, parasitising *Ceroplasia pseudociferus* in Japan, **119**
- Microwisea coccidivora*, invalidating control tests against *Tetranychus telarius* in Florida, **358**
- Middle East, migration of *Eurygaster* and *Aelia* spp. in, **233**
- Mildew (see *Podosphaera leucotricha*)
- Milk, DDT in, from human, **299**; DDT residues in, **312**; insecticide residues in, **418**; method for determining insecticide residues in, **419**; analytical method for insecticides in; secretion of DDT in; gas-chromatographic measurement of toxaphene in, **464**; examination of, for DDT residues, **654**
- Milk, Dry, piperonyl butoxide residues in, following paper bag treatment, **487**
- Millet, Finger (see *Eleusine coracana*)
- Millet, pests of, in India, **316**; *Chilo suppressalis* on, in Asia, **481** (see also *Panicum* and *Pennisetum*)
- Mimosa (see *Albizia julibrissin*)
- Minnesota, *Macrosiphum pisum* on lucerne in, **25**; *Ostrinia nubilalis* on maize in, **35**; *Malacosoma disstria* on *Populus tremuloides* in, **43**; *Pachygonatopus minimus* as parasite of *Macrosteles fascifrons* in, **156**; predators of *Ostrinia nubilalis* on maize in, **274**; *Lydella grisescens* in *Ostrinia nubilalis* and *Papaipema nebris* in, **305**; *Lydella grisescens* parasitising *Ostrinia nubilalis* on maize in, **366**; *Diabrotica virgifera* on maize in, **368**; biotypes of *Ostrinia nubilalis* from, **587**; *Archips cerasivoranus* and its parasites in, **642**
- Mint (see *Mentha*)
- Miolispa*, attacking rubber trees in Territory of Papua and New Guinea, **480**
- Miolispa novaeguineensis*, attacking rubber trees in Territory of Papua and New Guinea, **480**
- Mipafox, toxicity of, to insects and mice, **188**
- Mirex (see Dodecachlorooctahydro-1,3,4-metheno-2H-cyclobuta[cd]pentalene)
- Mirids, comparison of methods for collection of, on lucerne in Massachusetts, **368**
- Misocylops pini*, use of, for control of *Thecodiplosis brachyntera* in Germany, **659-660**
- Mississippi, *Anthonomus grandis* on cotton in, **46**; *Dalbulus maidis* and stunt virus of maize in, **70**; *Psara ipomoealis* on sweet potato in, **209**; *Anthonomus grandis* on cotton in, **273**; insect pests of cotton in, **360**; resistance of cotton strain 1514 to *Heliothis zea* and *Psallus seriatus* in, **362**; rearing disease-free colonies of *Anthonomus grandis* in, **363**; *Solenopsis saevissima richteri* in, **367**; *Mattesia grandis* infecting *Anthonomus grandis* in, **372**; *Anthonomus grandis* on glandless cotton in, **490**; penetration and metabolism of DDT in *Heliothis virescens* in, **491**; *Hibiscus syriacus* as alternate food-plant for *Anthonomus grandis* in; *Heliothis* spp. on *Geranium carolinianum* in, **539**; measures against overwintering population of *Anthonomus grandis* on cotton in, **580**; *Cardiophiles nigriceps* in relation to *Heliothis* spp., in, **581**; combined fungicide and insecticide treatment damaging cotton in, **641**
- Missouri, *Vitacea polistiformis* on vines in, **160**; predators of *Ostrinia nubilalis* on maize in, **274**; *Biolysia tristis* parasitising *Hypera*

- punctata* in, 364; insect-parasitic nematode designated DD-136 in, 541; biotypes of *Ostrinia nubilalis* from, 587
- Mites, predacious on Bruchids, 5; stimulating effect of DDT on, 9; natural enemies of, predacious species of, 47; fungi infecting, 49; on fruit trees, tomatoes, and lawn grasses in Rhodesia, 71; effects of herbicide on soil populations of, 75; in stored products, 78; predacious species of, 86; distribution of phytophagous and predacious, on apple in Holland; predacious species of, on plum in Germany; preying on *Panonychus ulmi* on plum in Germany, effect of climate on, 121; effect of spray chemicals on beneficial species of, on apple and pear in Holland, 122; attacking *Scolytus ventralis* on *Abies concolor* in California, 170; as predators on cotton in Arkansas, 179; use of ovicides against, 184; of subfamily Phytoseiinae in Central America, 211; as pests of tea in India, 219; preying on *Ostrinia nubilalis* on maize in United States, 275; control of, in Argentina, 288; in India, 316; predacious on *Tetranychus cinnabarinus* in Lebanon, 337; as pests of granaries overwintering in nearby trees in Portugal, 387; control of, on crops in Italy, 390; of cultivated plants in Portugal, 460; infestation and control of, in stored products, 465; in Iran, 519; infesting tea, 525; rearing and transportation of predacious species of, in Israel, 584; annotated list of, introduced into Israel, 620; on plants in Poland, 633
- Mitin FF, containing sodium salt of N-(3,4-dichlorophenyl)-N'-2-(2-sulpho-4-chlorophenoxy)-5-chlorophenyl-urea, 125
- Mocis latipes*, infestation and predators of, on rice in British Guiana, 172
- Mocis repanda*, bionomics, natural enemies and control of, outbreaks of, on pastures and crops in Venezuela, 212
- Moisture, effect of, on *Cleonus punctiventris*, 195; effect of, on hatching of *Locusta migratoria manilensis*, 221; effects of, on chorion of eggs of *Tribolium confusum*, 344; effects of, on development of *Contarinia nasturtii*, 529; effects of, in soil on population of *Rhizococcus cacticans*, 576
- Molasses, in bait for *Nematocerus sulcatus* and *Aperitmetus brunneus*, 135; effect of, in diet for Phytoseiid mites, 411; in baits, for *Oncopera* spp., 484
- Moles, as predators of Tipulid larvae, 329
- Momordica charantia*, *Dacus cucurbitae* on, in Philippines, 265
- Mongolia, *Apamea basilinea* damaging cereal crops in, 438; outbreak of *Apamea basilinea* on wheat in, 634
- Monital (see Nicotine)
- Monkey, *Lasioderma serricorne* recovered from skeleton of, 422
- Monoctonus cerasi*, parasitising aphids in Holland, 121
- Monodontomerus dentipes*, not harmed by systemic insecticides against *Diprion similis*, 588
- Monodontomerus minor*, parasitising *Itoplectis conquisitor* and *Thyridopteryx ephemeraeformis* in Virginia, 29
- Monofluor Acetyl Phenyl Urea, seed treatment with, against *Lissorhoptrus oryzophilus*, 161
- Monomorium minutum*, preying on larvae c. *Heterarthrus ochropodus* in Italy, 331
- Montana, *Pachygonatopus minimus* as parasite of *Macrosteles fascifrons* in, 156; *Dendroctonus brevicornis* on lightning-struck ponderosa pine in, 541
- Monuron (see N'-(4-Chlorophenyl)-N,N-dimethylurea)
- Moodna ostrinella*, larvae of, as scavengers in pine cones in Arkansas, 303
- Moose, DDT residues in, in United States, 641
- Mordellistena pumila*, control measures against, on lucerne in Turkmenia, 323; damaging lucerne in Turkmenia, 324
- Morestan (see Oxythioquinox)
- Morganela longispina*, on oranges in Florida, 543
- Morin, as feeding stimulant for *Anthonomus grandis*, 281
- Morinda citrifolia*, *Dialeurodes kirkaldyi* on, in Florida, 209
- Mormidea ypsilon*, on rice in British Guiana, 171
- Morocco, *Heterographis fulvobasella* on *Halogeton sativus* in, 164; migration of *Aelia* and *Eurygaster* spp. in, 233; *Anarsia lineatella* and *Cydia molesta* in, 333; *Aonidiella aurantii* on oranges in, 393; *Schistocerca gregaria* in, 597; *Euzophera osseatella* in, 611
- Morphothion, susceptibility of *Dermestes* to, 78; triphenyl phosphate not affecting toxicity of, to *Dermestes maculatus*, 254; toxicity of, to *Aonidiella aurantii*, 317
- Morus (see Mulberry)
- Moserina maculata*, parasitising species of *Pachypsylla* in U.S.A., 115
- Mosquitos, swollen abdomens in adults of, treated with insecticides, 276
- Moths, photo-electric counter to monitor olfactory responses of, 594
- Mouse, toxicity to, of analogues of dichlorvos, trichlorphon and naled, 292
- Mszycol (see BHC)
- Mucor sphaerosporus*, development of stored-product insects on, 237; feeding and oviposition of *Cryptolestes ferrugineus* on, 540
- Mulberry, *Agromyza morivora* on, in Japan, 87; *Bombyx mori* on, in Iraq, 103; *Aphytis africanus* sp.n. reared from *Pseudaulacaspis pentagona* on, in South Africa, 130; *Pseudococcus comstocki* on, in Soviet Union, 320; toxicity of insecticide residues on, to *Bombyx mori* in Brazil, 377
- Mullein (see *Verbascum*)
- Multanin 50, containing  $\gamma$  BHC and DDT, 337
- Multanin Ultra (see BHC)
- Murgantia histrionica*, bionomics of, 67; on cabbage, 68
- Musca domestica*, use of, in tests and bioassay of insecticides; detoxication and synergism of Bidrin in, 28; metabolism of thiopepa in, 39; toxicity of compounds of pyrethrum to, 112, 113; use of, in tests with synergists, 114; enzymatic hydrolysis of  $\alpha$ -naphthylacetate by, 117; toxicity of O,O-diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate to, 160; synergised carbamate insecticides against,



- 186; effect of thiono substituent on toxicity of fluorophosphates to, 188; penetration and metabolism of endotoxin in, 228; bioassay of dimethyl 1-dimethylcarbamoyl-1-propen-2-yl phosphate residues with, 344; insecticidal activity of alkylthiophenyl methylcarbamates in, 373; use of, in tests of effects of structure on biological activity of phenyl methylcarbamates, 420; cross-resistance phenomena in, 464; metabolism of dimethyl 1-methylcarbamoyl-1-propen-2-yl phosphate by, 507; *Smithiavirus pectinophorae*, not transmitted to, 536; mechanism of malathion resistance, in 546; effect of food on suitability of, as host for *Aphaereta pallipes*, 566; mechanism of resistance to insecticides in, 574; egg consumption by *Bembidion* spp., in laboratory prey density experiments with eggs of, 576; use of, in measuring narcotic potency, 623
- Musca domestica vicina*, insecticide resistance and nerve sensitivity in, 315
- Muscari comosum*, tolerance of, to methyl bromide fumigation and hot water treatments, 180; bromide residues from methyl bromide fumigations of, 419
- Muscat, *Schistocerca gregaria* in, 597
- Muscina stabulans*, *Leptinotarsa decemlineata* parasitised by, on potato in Soviet Union, 142; parasitising *Tortrix viridana* on oak in Portugal, 295
- Musgraveia sulciventris*, bionomics and natural enemies of, insecticides against, on *Citrus* in New South Wales, 314
- Mushrooms, Sciarids infesting, in Soviet Union, 55; effects of insecticides on, and Diptera on, 81
- Muskmelon, *Acalymma vittatum* on, in Kansas, 343
- Mussels (see *Elliptio complanatus*)
- Mustard, *Rhopalosiphum erysimi* on, in India, 146; varietal resistance to insect attack in, in Wisconsin, 275; varietal resistance of, to *Phyllotreta striolata* in North Carolina, 524
- Mustard Oil, stimulating oviposition by insects, 289
- Mustard-oil Glucosides, stimulating oviposition by *Hylemya brassicae*, 289; as feeding stimulant for *Pieris brassicae*, 292
- Mycodiplosis alternata*, bionomics and control of, 69
- Mycterotermes*, in Ethiopia, 467
- Myelophilus piniperda*, damaging pines and other conifers in Spain, 128; multiplication and natural enemies of, in relation to availability of breeding material in Finland, 383; attractant effect of  $\alpha$ -terpineol to, 567; damage caused to pine by, in Czechoslovakia, 656
- Mylabris phalerata*, damaging maize in India, 219
- Mylabris pustulata*, damaging maize in India, 219
- Mylocerus*, attacking groundnut in India, 216
- Mymar pulchellum*, type species of, 55
- Myrica cerifera*, *Strepsicrates smithiana* established on, in Hawaii, 174
- Myrica faya*, introduction of natural enemies of, in Hawaii, 174
- Myristic Acid, gas chromatography of, in *Hypera variabilis*, 413; methyl esters of, inhibiting growth of *Grylodes sigillatus*, 605
- Myrmica laevinodis*, *Rhagoletis cerasi* attacked by, 617
- Myzocallis komareki*, on cork oak in California, 494
- Myzus ascalonicus*, on sugar beet and weeds in Britain, 384
- Myzus cerasi*, insecticides against, on *Prunus mahaleb* in Bulgaria, 327
- Myzus cerasi pruniavium*, on cherry in Poland, 96
- Myzus lythri*, insecticides against, on *Prunus mahaleb* in Bulgaria, 327
- Myzus persicae*, on ornamental plants in Manitoba, parasite of, 24; transmitting virus from cherry, 26; transmitting tristeza virus of *Citrus*, 84; transmitting virus disease of artichokes; transmitting virus disease of cauliflower, 106; spread of leaf-roll virus by, on potato in South Africa, 130; infesting crucifers in Poland, 139; insecticides against, on potato in India, 146; insecticides against, on tobacco in Kentucky, 166; not transmitting mosaic virus of *Cajanus cajan* in India, 217; radiotracer studies of dispersal of, in beet fields in Belgium; sampling of, on beet in Britain, 229; as vector of broad bean mosaic virus in India, 259; on rape in Tasmania, 266; insecticides against, on potato in Arizona, 268; non-stable resistance to demeton-methyl in, in Britain, 291; not carried by *Lasius niger*, 292; transmission of pea mosaic virus by, in Czechoslovakia, 324; tobacco viruses transmitted by, in Rhodesia, 334; gut characters as means of determining origin of, in Britain, 335; clover yellow vein virus transmitted by, in Britain, 336; transmission of potato leaf-roll virus by, fed on artificial diet; viruses transmitted by, on beet in Germany, 338; swallowing own saliva, 340; food-plants of, in Venezuela, 343; systemic insecticides for control of, on tobacco in Maryland, 355; tests of dusts for control of, on lettuce in Texas, 367; on sugar beet and weeds in Britain, 384; time of flight in relation to incidence of beet yellows in Britain, 446; reared on leaf disks for ecological studies, 451; transmission of cucumber virus by, in France, 457; systemic insecticides against, on potato in Britain, 469; efficiency of, in transmitting pea enation mosaic virus, 492; transmission of papaya mosaic virus by, in Hawaii, 495; tests of antibiotics and other chemosterilants on, 496; transmitting yellows viruses of sugar beet in Britain, 505; factors affecting reproductive rates of, on brussels sprouts in Britain, *Aphidius matricariae* against, on chrysanthemums, 506; distribution of, on chrysanthemums in Britain, 533; temperature in relation to transmission of leaf-roll virus of potato by, in Poland, 534; disulfoton granules against, on potato and beet in Switzerland, 577; on pea in Iraq, 584; records of, in traps in Florida, 589; oesophageal and stomach inclusions of, feeding on crucifers, 600; not transmitting *Citrus* tristeza virus in

Israel, 636; resistance to organophosphorus insecticides in, on beet in Sweden, 650  
*Myzus ribisnigri*, on black currant in Poland, 96  
*Myzus varians*, on peach in Italy, 103

## N

N-2790 (see O-Ethyl S-Phenyl Ethylphosphonodithioate)

Nabam, phytotoxicity of, against *Psylla pyricola*, 643

*Nabis*, predacious on eggs of *Heliopsis zea* in Arkansas, 416; as predators of *Lygus hesperus*, parasitised by *Leucostoma simplex* in California, 583

*Nabis ferus*, in California, 37

*Nabisetus duplicisetus* sp.n., on grapes from Chile, 343

*Nacoleia charesalis*, distribution of, 177

*Nacoleia diemenalis*, in Malaya, on leguminous cover crops for rubber, endrin not recommended for use against, light-trap for, 41

*Nacoleia octasema*, distribution, ecology and control of, 177

NAD (see Naphthylacetamide)

Naled, insecticide against *Dacus dorsalis*, 37; portable equipment for aerial application of low-volume sprays of, 161; toxicity of, to cyclodiene-susceptible and cyclodiene-resistant strains of *Hylemya antiqua*, 163; in sprays against *Cydia pomonella*, 227; in sprays against *Stigmella malella*, 228; toxicity of, to agricultural insects, 283; analogues of, 283, 292; mouse toxicity and anticholinesterase activity of, to *Ceratitis capitata*, 292; in sprays, against Lepidopterous larvae, 348; in dusts, against *Trichoplusia ni*, *Macrosiphum ambrosiae* and *Myzus persicae*, 367; in sprays against *Cydia leucostoma*, 397; in sprays against *Oligonychus coffeae* and *Calacarus carinatus*, 398; residues of, on lettuce under glass, 518; as synergist with malathion against *Nephrotettix cincticeps*, 546; in sprays against *Neodiprion taedae linearis*, 643

Nankor (see Fenchlorphos)

Naphthalene Crystals, against *Limoniis canus*, 366

Naphthenic Oils, and systemic insecticides, against *Leucoptera coffeella*, 578

Naphthylacetamide, ineffective against damage induced by *Lygus lineolaris* feeding on strawberries, 496

$\alpha$ -Naphthylacetate, enzymatic hydrolysis of, by *Tetranychus telarius* and *Musca domestica*, 117

Narcissus, *Steneotarsonemus laticeps* on, in Britain, 386; effects of insecticide treatment used against *Steneotarsonemus laticeps* on, in Britain, 470

Narcotics, measurement of potency of, using *Musca domestica*, 623

Nasturtium (see *Tropaeolum minus*)

*Nasutitermes ephratae*, attractiveness to, of substances found in fungus-attacked wood; chemical decomposition of wood by, 406;

effectiveness of contact insecticides in stored pine sapwood against, 408

*Nasutitermes exitiosus*, use of, in tests of water-soluble wood preservatives, 408

Nasutitermitinae, revision of, in Ethiopia, 467

Naugatuck C-940 (see 2-(p-tert.-Butylphenoxy)-1-ethylethyl O-Tolyl Sulphite)

Naugatuck D-014 (see 2-(p-tert.-Butylphenoxy)cyclohexyl 2-Propynyl Sulphite)

*Nauphoeta cinerea*, *Smithiavirus pectinophorae* not transmitted to, 536

*Nausinoe geometralis*, bionomics, parasites and control of, on *Jasminum* in China, 220

Nebraska, predators of *Ostrinia nubilalis* on maize in, 274; association between *Phyllophaga anxia* and *Caloglyphus* sp. in, 343; *Empoasca fabae* on lucerne in, 365; *Stenodiplosis bromicola* on *Bromus* spp. in, 371; resistance of lucerne strains to *Therioaphis trifolii* in, 416; holocyclic strain of *Therioaphis trifolii* on lucerne in, 493; method devised in, for recovering eggs of *Diabrotica virgifera* from soil, 494; *Empoasca fabae* damaging sweet clovers in, 498; *Stenodiplosis bromicola* on *Bromus* spp. in, 639;

*Necrobia ruficollis*, records of, infesting textiles in Germany, 521

Neem (see *Azadirachta indica*)

Nellite (see Phenyl N,N'-Dimethylphosphorodiamide)

Nemacide (see Dichlofenthion)

*Nemapogon cloacellus*, damaging corks of wine bottles in Germany, 237

Nematicides, formulation and guide to, 246

*Nematocerus sulcatus*, insecticides against, attacking tea seedlings in Kenya, 134

Nematodes, transmission of, by *Rhynchophorus palmarum*, 70; parasitising grasshoppers in Quebec, 157; as pests of tea in India, 219; infection of insects by, 427

*Nemoctes incomptus*, tolerance of larvae of, to soil insecticides in British Columbia, 422

*Nemorilla floralis*, parasitising *Tortrix viridana* on oak in Portugal, 295

*Nemorilla maculosa*, *Nausinoe geometralis* parasitised by, in China, 221; parasitising *Archips xylosteanus* on *Quercus suber* in Portugal, 294

*Neoapectana*, unidentified species of designated DD-136, 541; infesting *Scutigerella*, 572

*Neoconocephalus maxillosus*, infestation and control of, on rice in British Guiana, 172

*Neocypholaelaps stridulans*, on *Areca catechu* in India, 664

*Neodiprion dubiosus*, recognition of, on *Pinus banksiana* in Wisconsin, 307

*Neodiprion fulvipes*, distribution of eggs of species in complex of, on *Pinus ponderosa* in California, 311

*Neodiprion pratti*, sterols of, in relation to those of *Pinus virginiana* and *Pinus rigida*, 620

*Neodiprion pratti pratti*, diseases of, natural enemies of, on *Pinus virginiana* in Virginia, 34

*Neodiprion rugifrons*, recognition of, on *Pinus banksiana* in Wisconsin, 307; bionomics of, on *Pinus banksiana* in Wisconsin, 647

*Neodiprion sertifer*, on pine in Ontario, study of population dynamics of, 19; photo-



- periodism in development of, **158**; effect of DDT on, parasites of, on mountain pine in Czechoslovakia, **200**; review of, in Ontario, **239**; use of virus for control of, on pine in Germany, **339**; individual rearing of larvae of, in Connecticut, **348**; method of detecting virus infection in adults of, on pine in Finland, **384**; use of polyhedrosis virus in sprays against, on pine in Scotland, **432**; relative susceptibility of ponderosa and red pine to, in Michigan, **543**; geographic variation in photoperiodic reaction of, **616**; determination of critical number of, on *Pinus mugo uncinata* in Czechoslovakia, **632**
- Neodiprion swainei*, study of population dynamics of, on *Pinus banksiana* in Quebec, **19**; effects of temperature on, **21, 24**; effects of virus on habits of, in Quebec, **50**; transovarian transmission of *Borrelinavirus* in, **431, 432**; *Borrelinavirus* in control of, on *Pinus banksiana* in Canada, **432**
- Neodiprion taedae linearis*, control measures against, on pine in Arkansas, **643**
- Neodiscodes indicus*, parasitising *Nipaecoccus vastator* in India, **86**
- Neomaskellia bergii*, on sugar-cane in India, **238**
- Nephantis serinopa*, list of parasites, hyperparasites, predators and pathogens of, on coconut in Ceylon and India, **56**; distribution of maps of, **617**
- Nephelium litchi* (see *Litchi chinensis*)
- Nephotettix*, revision of genus, **87**
- Nephotettix apicalis*, geographical distribution of, transmitting virus diseases of rice, characters differentiating, from *N. cincticeps*, **87**
- Nephotettix apicalis yapicola*, in Micronesia, **87**
- Nephotettix bipunctatus*, synonymy of, **87**
- Nephotettix cincticeps*, geographical distribution of, characters differentiating, from *N. apicalis*, transmitting virus diseases of rice, **87**; cultivation of embryonic tissues of; plant virus multiplication in, method for collecting salivary sheath material of, **115**; electron microscopy of virus passage in, **180**; resistance to malathion in, in Japan, **545**; comparative susceptibility of males and females of, to insecticides in Japan, **546**
- Nephotettix impicticeps*, geographical distribution of, synonymy of, transmitting rice yellow dwarf virus, **87**
- Nephrotoma crocata*, control measures for, injurious to agriculture in Italy, **329**
- Nephrotoma maculata*, control measures for, injurious to agriculture in Italy, **329**
- Nephrotoma pratensis*, control measures for, injurious to agriculture in Italy, **329**
- Nepticula heringella*, bionomics and parasitism of, on *Quercus ilex* in Sicily, **610**
- Nerium oleander* (see *Oleander*)
- Netelia*, parasitising *Heliothis* spp. in U.S.A., **539**
- Neurotoma flaviventris*, infestation and control of, on cherry in Yugoslavia, **257**
- Nevada, *Ips carinulatus* on pine in, **303**
- New Britain, *Deretrachia szentivani* sp.n., on *Theobroma cacao* in, **463**
- New Brunswick, *Rhagoletis pomonella* on apple in, **24**; *Cephalcia fascipennis* on spruce in, **152**; fungous deterioration of balsam fir killed by *Choristoneura fumiferana* in, **309**; *Tremex columba* in, **402**; grain aphids in, **424**; population dynamics and natural enemies of *Argyresthia laricella* in, **501**
- New Caledonia, attempted establishment of *Tetrastichus brontispae* against *Brontispa longissima* on palms in, **560**
- New England, defoliation by *Lymantria dispar* in, **463**
- Newfoundland, establishment of *Sorex cinereus* against *Pristiphora erichsonii* in, **501**
- New Guinea, new species of Chrysomeloidea in, **115**
- New Hampshire, *Cephalcia fascipennis* on spruce in, **152**
- New Hebrides, *Aspidiotus destructor* infesting coconut in, **223**
- New Jersey, flight records of Hemiptera in, **42**; treatment of lilies against aphids in, **160**; *Patasson conotrachelii* overwintering in eggs of *Hypera variabilis* in, **359**; *Popillia japonica* in, **364**; natural enemies of *Lygus* spp. on lucerne in, **583**
- New Mexico, *Frankliniella occidentalis* on cotton, onion, lucerne, and lettuce in, **43**; diatomaceous earth tested against *Choristoneura fumiferana* on *Pseudotsuga menziesii* in, **498**; *Dendroctonus adjunctus* and associated nematodes on *Pinus ponderosa* in, **537**; *Macrosiphum pisum* on lucerne and peas in, **647**
- New South Wales, *Chortoicetes terminifera* in, **266**; *Tiphia vernalis* as parasite of *Popillia japonica* in; hyperparasites of *Bathyplectes curculionis* parasitising larvae of *Hypera variabilis* on lucerne in, **369**; *Macrosiphum pisum* parasitised by *Aphidius smithi* in, **501**; *Eurytoma fellis* and *Musgraveia sulciventris* on *Citrus* in; *Hakea* spp. in, **314**; *Phyllocoptruta oleivora* and *Tegolophus australis* on *Citrus* in, **315**; *Didymuria violescens* on *Eucalyptus* in, **396**; distribution of *Perga affinis affinis* in, **403**
- New York, *Hylemya* on radish in, **36**; *Hypera variabilis* on lucerne in, **36, 62, 63**; *Agallia constricta* on crimson clover in; virus disease of crimson clover in, **70**; *Tetranychus telarius* on strawberry in, **163**; *Hoplocampa brevis* on pear in, **210**; insecticide residues on lucerne and maize in, **276**; *Macrosteles fascifrons* on lettuce in, **285**; *Beauveria bassiana* attacking *Hypera variabilis* in, **296**; *Lymantria dispar* on oak in, **356**; *Hylemya antiqua* on onion in, **356, 357**; *Hypera variabilis* on lucerne in, **362**; *Otiorynchus ligustici* on forage crops in, **368**; *Lygus lineolaris* damaging strawberries in, **496**; suppression of *Panonychus ulmi* on apple by mildew fungicide programmes in, **498**; control of *Hypera variabilis* on lucerne in, **580**
- New Zealand, natural enemies of caterpillars in, **115**; *Rhopalosiphum padi* on wheat in, **118**; *Costelytra zealandica* in, **176**; DDT residues in cows milk in; DDT residues in depot fat of sheep in, **312**; *Nysius huttoni* as pest of

- cruciferous vegetables in; *Metarrhizium anisopliae* strains in, 313; *Hakea* spp. in, 314; control of *Costelytra zealandica* in, 450; treatment of pasture against *Oxycaenus* spp. in, 484; *Costelytra zealandica* in pastures in, 616
- Nexion (see Bromophos)
- Nezara viridula*, control of, on cotton in Kenya, 134; adult dispersal of, in relation to feeding and oviposition in Japan, 151; attacking beans in Tanganyika, 394; nymphal aggregation in, 547
- Nezara viridula smaragdula*, introduction, propagation, liberation, and establishment of parasites against, in Hawaii, 173
- NIA 9203 (see O,O-Dimethyl S-((2-Oxo-3-benzoxazolyl)methyl) Phosphorothioate)
- NIA 10242 (see 2,3-Dihydro-2,2-dimethyl-7-benzofuranyl Methylcarbamate)
- Niacide (mixture of organic fungicides), not affecting *Panonychus ulmi*, 157
- Niacin, attractive to *Eurytoma roddi*, 57
- Niagara 9203 (see O,O-Dimethyl S-((2-Oxo-3-benzoxazolyl)methyl) Phosphorothioate)
- Niagara 10242 (see 2,3-Dihydro-2,2-dimethyl-7-benzofuranyl Methylcarbamate)
- Nicaragua, mites of subfamily Phytoseiinae in, 211; *Bemisia tabaci* on cotton and other plants in, 401
- Nicotine, effects of, on mechanism of action of organophosphorus compounds on insects, 13; against *Macrosiphum pisum*, 82; mode of action of, 184; with soap and DDT or copper sulphate, in sprays against *Dacus cucurbitae*, 265; in sprays against *Panonychus ulmi*, not affecting *Blepharidopterus angulatus*, 470, 471; as insecticide, 622; ineffective in sprays against *Trioza tremblayi*, 627; *Myzus persicae* not resistant to, 650
- Nicotine Sulphate, in sprays against *Typhlocyba rosae*, 197; in sprays against *Labioproctus polei*, 263; effectiveness of, against *Cydia funebrana*, 452; against *Psylla pyricola*, 643
- Niger, *Schistocerca gregaria* in, 597
- Nigeria, factors governing storage of cereals in, 50; pests of stored sorghum in, 77; pests of stored groundnuts in, 110;  $\gamma$  BHC contamination in stored sorghum and millet in, 133; *Acanthopsycha tristoides* on cacao in, 403; distribution of termites in, 467; Dynastids attacking yams in, 570; pests of cowpea in, 605; report on pests and diseases of cacao in, 625-627
- Nigrospora sphaerica*, feeding and oviposition of *Cryptolestes ferrugineus* on, 540
- Nilaparvata lugens*, distribution map of, 401
- Nipa fruticans*, *Nacoleia octasema* on, 177
- Nipaeococcus filamentosus*, on *Citrus* in Iran, 519
- Nipaeococcus vastator*, on *Citrus*, vines *Euphorbia hirta* and *Dalbergia sissoo* in India, parasites of, in India, 86
- Niptus hololeucus*, records of, infesting textiles in Germany, 521, 522
- 5-Nitro-2-furaldehyde-2-(2-hydroxyethyl) Semicarbazone, effect of, on *Tribolium confusum*, 616
- Nitrogen, as plant nutrient, effect of, on *Chilo suppressalis*, 147; as plant nutrient, effect of, on development of *Anobium punctatum*, 181; as plant nutrient, effect of, on fecundity of *Sciopithes obscurus* and *Otiorynchus sulcatus*, 268; as plant nutrient, effect of, on fecundity of *Saccharosydne saccharivora* on sugar-cane, 289; effect of, in groundnut plants on fecundity of *Aphis craccivora*, 317; as plant nutrient, effect of, on reproduction of *Tetranychus telarius*, 353; as plant nutrient, effects of deficiency of, on *Rhopalosiphum maidis*, 356; as plant nutrient, effects of, on *Tetranychus telarius*, 484; as plant nutrient, effects of, on reproductive rates of aphids, 506; effect of, on respiration in *Tribolium*, 584; as plant nutrient, effects of, on survival of *Ostrinia nubilalis*, 644; uric acid in metabolism of, in *Anthonomus grandis*, 645
- p-Nitrophenol, not toxic to oranges, in sprays against *Aonidiella aurantii*, 393
- Nola distributa*, bionomics and control of, on walnut in China, 265
- Nomadacris septemfasciata*, in Mali and Madagascar; in Mauritius and Réunion, 111; in Tanganyika, 112, 234; in central Niger delta, in Mali, 234; assessing adult populations of, by helicopter in Tanganyika, 531; influence of photoperiod on imaginal diapause in, 604; storks and egrets as predators of, in Tanganyika, 627
- Nomia melanderi*, effect of temperature on development of, 238
- Nonachlor (see 1,2,3,4,5,6,7,8-Nonachloro-3a,4,7,71-tetrahydro-4,7-methanoindan)
- 1,2,3,4,5,6,7,8-Nonachloro-3a,4,7,71-tetrahydro-4,7-methanoindan, in baits, granules and soil treatment with, against *Solenopsis saevissima richteri*, 367; in baits for *Pogonomyrmex occidentalis*, 486
- Nonyl Phenol-10 Ethylene Oxide, pyrethrum formulated in, phytotoxicity of, 81
- Nootkatol, not toxic to larvae of *Hylotrupes bajulus*, 405, 407
- Nootkatol-copper, toxicity of, to larvae of *Hylotrupes bajulus*, 405
- DL-Norvaline, attractiveness of, to *Eurytoma roddi*, 57
- Norway, new pests on cultivated plants in, 55; forest pests in, *Hylobius abietis* on conifers in, 57; *Tetranychus telarius* in, 181; *Hylotrupes bajulus* in; finding of *Thermobia domestica* in, 237; aphids recorded on cultivated plants in, 239; glycerol and cold-hardiness in Lepidoptera in, 423; sorbitol and supercooling point of winter eggs of *Panonychus ulmi* in, 424; *Hylobius abietis* on conifers in, 563
- Nosema*, laboratory techniques for eliminating, from colonies of *Anthonomus grandis* in Mississippi, 363; species of, infecting larvae of *Euproctis chrysorrhoea* in Poland, 427; affecting laboratory populations of *Anthonomus grandis*, 579
- Nosema bombycis*, transmitted by *Sancassania to Bombyx mori* in Czechoslovakia, 345
- Nosema lymantriae*, parasitising *Lymantria dispar*, 256
- Nosema melolonthae*, microsporidiosis caused by, in larvae of *Melolontha melolontha* in France, 427



*Nosema muscularis*, difference between *N. m. toletanica* and, 256

*Nosema muscularis toletanica* subsp. n., parasitising *Lymantria dispar* on oak in Spain, 256

*Nosema polyvora*, effect of, on diapause and survival of *Apanteles glomeratus* and *Pieris brassicae*, 436

*Nosema serbica*, parasitising *Lymantria dispar*, 256

Nova Scotia, *Lithocolletis propinquella* on *Prunus serotina* in, 21; *Cydia pomonella* on apple in, 56; *Cephalcia fascipennis* on spruce in, 152; *Ips thomasi* sp.n. on spruce in, 153; *Hylemya brassicae* on swedes in, 157; sampling predator populations on apple in, 203; *Monochaeta albicans* in, 346; nuclear polyhedrosis virus of *Operophtera brumata* in, 502; *Chlamisus cribripennis* on blueberry in, 581

Nutgrass, Purple (see *Cyperus rotundus*)

Nutgrass, Yellow (see *Cyperus esculentus*)

Nuts, treatment of, damaged by insects and mites in Turkey, 614

Nuvan (see Dichlorvos)

*Nycteola cinereana*, mortality due to *Bacillus thuringiensis* in, in Ontario, 352

*Nymphalis antiopa*, effects of cytoplasmic polyhedrosis on, 56; mortality due to *Bacillus thuringiensis* in, in Ontario, 352

*Nymphula nymphaeata*, possibly responsible for damage to polythene, 289

*Nysius huttoni*, as pest of cruciferous vegetables in New Zealand, 313

*Nysius raphanus*, parasitised by *Hyalomya aldrichi* in California, 583

*Nythobia*, parasitic in larvae of *Enarmonia ratzeburgiana* in Quebec, 349; parasitic in *Plutella maculipennis* in Chile, 377

*Nythobia armillata*, parasitising *Hyponomeuta padellus malinellus* in Yugoslavia, 392

*Nythobia blackburni*, parasitising *Bactra truclella* on nutgrass in Hawaii, 175

## O

Oak (see also *Quercus*)

Oak, *Sitophilus granarius* breeding in acorns of, 5; *Lymantria dispar* on, in Yugoslavia, 7; *Pseudopityophthorus* spp. on, in W. Virginia, *Pseudopityophthorus prunosus* in relation to infection of, by *Ceratocystis fagacearum*, 33; in diet for *Melolontha melolontha*, 107; parasites of *Tortrix viridana* on, in Europe, 123; effect of birds on insect and spiders on, in Germany, 126; *Archips crataeganus* on, in Soviet Union, 142; *Archips griseus* on, in United States, 179; factors reducing numbers of *Archips crataeganus* on, in Czechoslovakia, 199; *Xyleborus monographus* on, in Germany, 336; *Lymantria dispar* on, in Connecticut, 373; *Lymantria dispar* on, in Spain, 389; infested by *Lyctus linearis* in Hungary, 402; *Lymantria dispar* on, in Spain, 432; parasites of insect pests on, in Soviet Union, 508; encouragement of birds in areas where

*Tortrix viridana* is injurious to, in Germany, 523

Oak, Cork (see *Quercus suber*)

Oak, Evergreen (see *Quercus ilex*)

Oak, Garry (see *Quercus garryana*)

Oak, Red (see *Quercus rubra*)

Oats (see also *Avena*) aphids in relation to virus diseases of, 69; *Haplodiplosis equestris* on, in Germany, 100; *Athesapeuta cyperi* developing on, in Hawaii, 175; aerial density of *Oscinella frit* over, in Britain, 233; fat content in relation to insecticide contamination of seeds of, 281; *Lema melanopa* on, in Michigan, 302; *Lema melanopa* on, in Indiana, 307; *Rhopalosiphum fitchii* and *R. padi* reared on, in Manitoba, 311; protection of, from pests in Soviet Union, 319; thrips on, in Holland, 341; Auchenorrhyncha and Heteroptera on, in Sweden, 345; *Pseudaletia unipuncta* on, in Ontario, 350; effect of herbicide treatment of fields of, on populations of aphids and Coccinellids in New Brunswick, 424; *Petrobia latens* on, in Queensland, 449, 450; varietal susceptibility of, to *Chlorops pumilionis* and *Oscinella frit* in Rumania, 462; *Eurygaster integriceps* on, in Bulgaria, 554; resistance to *Lema melanopa* in, in Michigan, 582; transmission of barley yellow-dwarf virus to, by aphids, 631; attacked by *Lema melanopa* in Michigan, 642

Oats, Rolled (see Rolled Oats)

Oats (Stored), *Aeroglyphus robustus* in, in Canada, 495

Oats, Wild (see *Avena fatua*)

*Oberea oculata*, bionomics of and measures against, on basket willows in Yugoslavia, 6

*Ochropleura herculea*, on wheat in India, 86

*Ocnogyna baetica*, on chervil, broad beans and leeks in Tunisia, 393

Octachlorocamphene (see Terpentol B)

Octachlorodipropyl Ether, not improving residual action of pyrethrins, 225

Octamul (see Aldrin)

Octyl Phenol-8 Ethylene Oxide, pyrethrum formulated in, 81

*Odonaspis secreta*, parasites of on bamboo in Japan, 87

*Odontotarsus*, *Asolcus semistriatus* parasitising eggs of, in Soviet Union, 189

*Odontotermes*, not associated with damage to *Eucalyptus* in Uganda, 443; protection of freshly felled timber in storage against, in India, 615

*Odontothrips confusus*, bionomics and control of, on lucerne in France, 390

*Oebalus poecilus*, infestation and control of, on rice in British Guiana, 171; fungi isolated from, effect of, on rice yield and quality in British Guiana, 638

*Oebalus pugnax*, control of, on irrigated rice in Louisiana, 282

*Oebalus ypsilongriseus*, on rice in British Guiana, 171

*Oechalia schellenbergii*, predacious on caterpillars in New Zealand, 115

*Oedocephalum*, attacking *Scolytus ventralis* on *Abies concolor* in California, 170

*Oemida gahani*, biology and control of, in forests in Kenya, 444

- Ohio, *Panonychus ulmi* on apple in, 26;  
*Ostrinia nubilalis* on maize in, 35; *Conotrachelus nenuphar* on peach and plum in, 165;  
*Bathyplectes curculionis* in, 168; insecticide resistance in *Diabrotica longicornis* on maize in, 491; control of *Blissus leucopterus* on maize in, 499; *Limoniuss dubitans* in, 594; effects of plant nutrients on survival of *Ostrinia nubilalis* on maize in, 644
- Oil Emulsion, and insecticides, against *Parlatoria blanchardii*, 144; and chlordecone, in sprays against Coccids, 207; and insecticides, against Coccids, 208; in sprays against *Panonychus ulmi*, 284; alone or with DDT or an organophosphate, in sprays against Coccids, 328; and parathion, against *Archippus oporanus*, 330; in sprays against *Quadraspidiotus perniciosus*, 343; in sprays against *Aonidiella aurantii*, 376; against *Panonychus ulmi*, 381; and parathion, in sprays against Coccids, 390; in sprays against *Saissetia oleae*, 400; in sprays against *Trialeurodes floridensis*, 416; tests of, in sprays against Coccids in papaya, 450; in sprays against *Panonychus ulmi*, susceptibility of *Blepharidopterus angulatus* to spray programmes of, effect of, on *Typhlodromus pyri*, 470; in sprays against *Stomacoccus platani*, 486; gibberellic acid protecting oranges sprayed with, against water spot, 491; DDT in, 551, 552; in sprays against *Argyresthia ephippella*, 553; and systemic insecticides against *Leucoptera coffeella*, 578; and insecticides against *Thrips tabaci*, 590; ineffective in sprays against *Trioza tremblayi*, 627; in sprays against *Bryobia rubrioculus*, 640; against *Psylla pyricola*, 643; alone and with DNC or parathion, in sprays against spider mites and *Psylla pyri*, 651
- Oils, Essential, for attracting insects, 399; inhibiting development of *Hylotrupes* larvae, 407
- Oil, Mineral, in sprays against *Aonidiella aurantii* and *Panonychus citri*, 32; other uses of, as solvent or carriers for insecticides, 36; and parathion or malathion, 98; reducing toxicity of insecticides to *Pauridia peregrina*, 132; and malathion, 207; reducing residual action of pyrethrum sprays, 225; and DNC, 230; apples used in mass rearing *Conotrachelus nenuphar* treated with, 286; with Tetradifon and thioquinox, against *Tetranychus cinnabarinus*, 337; and malathion, against Coccids, 473; with parathion, against *Phenacoccus mespili*, 553; and systemic insecticides, against *Leucoptera coffeella*, 578; and parathion against *Cryptoblabes gnidiella*, 608; and parathion, in sprays against *Cadra cautella*, 609
- Oil, Mustard (see Mustard Oil; Allyl Mustard Oil)
- Oil Palm (see *Elaeis guineensis*)
- Oils, Vegetable (see Cottonseed, Groundnut, Linseed and Olive Oils)
- Oilseed, protection of, from insect pests in India, 216; pests of, in India, 316
- Oilseed Cakes, treatment with fumigants and contact insecticides against *Trogoderma granarium* in, 333
- Oinophila v-flava*, introduction of, to California from Europe, 116
- Olive Oil, determination of parathion residues in, 394
- Oklahoma, *Pectinophora gossypiella* on cotton in, 63; *Stenodiplosis bromicola* on *Bromus* spp. in, 639
- Okra (see *Hibiscus esculentus*)
- Oleander, Yellow (see *Thevetia peruviana*)
- Oleander, *Aphis nerii* on, in Italy, question of replacement of *Pittosporum tobira* by, for control of *Toxoptera*, 103; *Phenacaspis cockerelli* on, in Florida, 543
- Oleic Acid, gas chromatography of, in *Hypera variabilis*, 413
- Oleoparathion, against *Aphis fabae*, 98; in sprays against *Stigmella malella*, 228; and parathion, in sprays, against *Archippus oporanus*, 330; against *Blaniulus guttulatus*, 577
- Olfactometer, a simplified, for insects, 56; electronic counting apparatus for use in, 180
- Oligomerus brunneus*, attacking deciduous trees in Poland, 324
- Oligonychus afasiaticus*, on date in Iran, 519
- Oligonychus coffeae*, tests of sprays against, on tea in India, 398; infesting tea in India, 663
- Oligonychus indicus*, comparison of toxicants against, on sugar-cane and other crops in India, 318
- Oligonychus mangiferus*, distribution maps of, 401; effect of insecticides and acaricides on, on cotton in Egypt, 474
- Oligonychus peruvianus*, on *Citrus* in Venezuela, 287
- Oligonychus punicae*, *Amblyseius hibisci* predacious on, in California, 306; interactions between *Amblyseius hibisci* and, on *Persea indica*, 648
- Oligonychus terminalis*, as synonym of *Oligonychus mangiferus*, 401
- Oligonychus ununguis*, distribution of eggs of, on spruce in Germany, 59; sprays against, on *Pseudotsuga menziesii* in British Columbia, 421
- Oligonychus yothersi*, bionomics of, on apple in Chile, 47; *Oligota pygmaea* predacious on, on avocado, 377
- Oligosita*, species of parasitising *Empoasca devastans* in India, 86
- Oligota* sp., as predator of *Panonychus citri* in Formosa, 315
- Oligota pygmaea*, destroying other insects, in Chile, 47; predacious on *Oligonychus yothersi*, attacking *Porphyrosela minuta* in Chile, 377
- Olive, for oviposition of *Dacus oleae*; *Saissetia oleae* on, in Greece, 52; *Dacus oleae* on, in Italy, metabolism of insecticides in, 92; *Saissetia oleae* on, in Italy, 94; *Dacus oleae* on, in France, 107, 108; metabolism of dimethoate labelled with <sup>32</sup>P in, 116; *Prays oleae* on, in Portugal, 386; *Dacus oleae* on, in Italy, 390; *Celerio lineata livornica* on, in Tunisia, 393; *Saissetia oleae* on, in Israel, 400; *Dacus oleae* on, in Greece, 411; establishment of *Chilocorus bipustulatus* against Coccids on, in California, 543; *Dacus oleae* on, 543-545; sterilization of *Dacus oleae* on, in Greece,



- 578; use of *Opius concolor sicularis* against *Dacus oleae* on, in Italy, 607; *Lytta vesicatoria* and *Omophlus lepturoides* on, in Sicily, 611; effects of carbaryl on insect fauna of, in Italy, 628; relation between *Dacus oleae*, *Prolasioptera berlesiana* and *Macrophoma* spot on, in Israel, 637; *Dacus oleae* on, in Israel, 638
- Olive Oil, method of determining residues of phenthoate in, 94
- Ollarianus strictus*, reared from *Citrus* in Texas; parasitised by *Lymaenon marylandicus*, 648
- Oman, *Schistocerca gregaria* in, 597
- Omophlus lepturoides*, insecticides against, damaging olive trees in Sicily, 611
- Omphale clypealis*, parasitising *Dasyneura brassicae* on rape in Sweden, 182
- Oncopeltus fasciatus*, penetration and metabolism of  $^4\text{H}$  dimethoate in, 27; toxicity and metabolism of O,O-dimethyl O-p-dimethylsulphamoyl-phenyl phosphorothioate in, 188
- Oncopera brachyphylla*, control of, damaging pastures in Queensland, 484
- Oncopera mitocera*, control of, damaging pastures in Queensland, 484
- Onion, insecticide residues in, following seed treatment, 137; *Eumerus* spp. on, in Soviet Union, 192; *Hylemya antiqua* on, in Soviet Union, 194; effects of soil applications of DDT and aldrin on, 231; *Hylemya antiqua* on, in New York State, 356, 357; *Petrobia latens* on, in Queensland, 449; *Thrips tabaci* on, in California, 590; infestation of, by *Trioza tremblayi* in Italy, 627
- Onobrychis viciifolia*, *Eurytoma onobrychis* and *Bruchidius unicolor* on, in Bulgaria, 554
- Ontario, pests of pine and spruce in, 19; *Hylemya trichodactyla* on beans, maize and tobacco in; *Frankliniella occidentalis* on, in New Mexico, 43; forest pests in; *Entomophthora* infesting aphids in, 44; *Cephalcia fascipennis* on spruce in, 152; *Atomacera debilis* attacking *Desmodium* spp. in, 155; climatic suitability for infestation of stored grain insects in, 156; *Pristiphora aquilegiae* on columbine in; *Melanoplus sanguinipes* in; *Ceratocystis ulmi* in galleries of *Hylastes rufipes* on elm in, 179; dispersal of Carabid species on soil surface in; changes in population of leaf-rollers on apple in, 201; species of *Eulecanium* attacking orchard and other trees in, 203; distribution of *Reticulitermes flavipes* in, 204; *Hoplocampa brevis* on pear in, 210; *Neodiprion sertifer* in, 239; *Tetranychus telarius* on apple in, 266; *Ostrinia nubilalis* on maize in; *Aegeria exitiosa* on peach in, 267; fungous decay in dead balsam fir in, 309; *Chrysomela crotchii* on *Populus tremuloides* in, 311; *Pseudaletia unipuncta* on cereal crops in; *Thymelicus lineola* on grasses in; factors affecting migration of *Tetranychus telarius* in; *Tetranychus telarius* on cucumbers in, 350; *Leiophron pallipes* in Mirid hosts in; *Aphidius smithi* and other parasites of *Macrosiphum pisum* on lucerne in, 351; insecticide control of pests of peach in; *Bacillus thuringiensis* against Lepidoptera in, 352; *Aegeria pictipes* on peach in; *Protoparce quinquemaculata* reared in laboratory in, 353; *Malacosoma disstria* in, 371; *Sitophilus granarius* in, 372; *Psylla pyricola* in, 402; mass rearing of *Hylemya brassicae* in, 489; susceptible and cyclodiene-resistant strains of *Hylemya brassicae* in, 493
- Onychiurus*, on grass and white clover in Holland, in relation to injurious fungi, 383
- Ooencyrtus neustriae*, parasitising *Malacosoma neustria* on oak in Portugal, 295
- Ooencyrtus ptyocampae*, parasitism by, not affected by dusts against *Thaumetopoea ptyocampa* on pine in Spain, 127; parasitising *Thaumetopoea ptyocampa* on pine in Portugal, 295; parasitic in eggs of *Thaumetopoea ptyocampa* in Spain, 389
- Ooencyrtus submetallicus*, introduction and release of, against *Nezara viridula smaragdula* in Hawaii, 173
- Ooencyrtus telenomicidus*, parasitising eggs of *Eurygaster integriceps* in Soviet Union, 549
- Ooencyrtus trinidadensis*, introduction and release of, against *Nezara viridula smaragdula* in Hawaii, 173
- Ootheca mutabilis*, insecticides against, damaging cowpea in Nigeria, 605
- Operophtera brumata*, effects of cytoplasmic polyhedrosis on, 56; effect of predation by birds on, in oak forests in Germany, 126; comparative spray tests with *Bacillus thuringiensis* against, on apple in Germany, 337; *Monochaeta albicans* parasitic in, on red oak in Nova Scotia, 346; nuclear polyhedrosis virus of, in Nova Scotia, 502
- Ophiomyia lantanae*, released against *Lantana camara* in South Africa, 129
- Ophion luteus*, parasitic in *Apamea basilinea* in Mongolia, 634
- Opius concolor*, parasitising *Dacus oleae*, 107; parasitising *Ceratitis capitata*, 244
- Opius concolor sicularis*, use of, against *Dacus oleae* on olives in Italy; taxonomy of; laboratory rearing of, on *Ceratitis capitata*, 607
- Opius longicaudatus*, parasitising *Dacus dorsalis* in Marianas, 37; differential effect of  $\gamma$ -radiation on fruit flies and, 171
- Opius oophilus*, parasitising *Dacus dorsalis* in Marianas, 37; differential effect of  $\gamma$ -radiation on fruit flies and, 171
- Opius rhagoleticolus*, parasitising *Rhagoletis cerasi* on cherry in Poland, 138
- Opshomala lanceolata*, infestation and control of, on rice in British Guiana, 172
- Opuntia ficus-indica*, *Ceratitis capitata* on, in Tunisia, 244
- Orange, *Toxoptera citricida* in relation to viruses of *Citrus tristeza* complex of, 60; Coccids on, in Sicily, and Sardinia, 95; *Aphytis africanus* sp.n., reared from *Aonidiella aurantii* on, in South Africa, 130; virus disease of *Panonychus citri* on, in California, 167; effect of sprays on, 207; Coccids on, in Florida, 208; dimethyl 1-dimethyl-carbamoyl-1-propen-2-yl phosphate residues in peel of, 240; fruit-flies on, in Brazil, 241; factors limiting infestation of, by *Ceratitis capitata* in Tunisia, 244; *Chilocorus bipustulatus* reared on, infested with

- Chrysomphalus ficus*, 258; *Labioproctus polei* on, in India, 262; *Panonychus citri* on, in California, 269; *Eurytoma fellis* and *Musgravea sulciventris* on, in New South Wales, 314; *Tegolophus australis* sp.n. on, in New South Wales, 315; *Aculus pelekassi* on, in Italy, 331; *Tetranychus cinnabarinus* on, in Lebanon, 337; persistence of insecticides on and in, 374; *Parlatoria cinerea* on, in Brazil, 377; *Chilocorus bipustulatus* on, in Israel, 390; damage to, caused by parathion and methyl-parathion used against *Aonidiella aurantii* in Morocco, 393; insect-transmissible virus of, related to greening in South Africa, 396; *Saissetia oleae* on, in Israel, 400; water spot protection of, with gibberellic acid in California, 491; *Morganella longispina* on, in Florida, 543; *Cadra cautella* on, in Sicily, 609; *Ollarianus strictus* and *Lymaenon marylandicus* reared from, in Texas, 648
- Orange, Bitter (see *Citrus bigaradia*)
- Oregon, *Megachile rotundata* as pollinator of lucerne in, 38; *Lambdina fiscellaria lugubrosa* on *Tsuga heterophylla* in, 42; *Salvia aethiopis* in, 273; Diptera associated with *Dendroctonus pseudotsugae* in, 310; *Choristoneura lambertiana subretiniana* on pine in, 347; phagocytosis of *Bacillus thuringiensis* in *Pseudaletia unipuncta* in, 372; method for rearing larvae of *Medetera aldrichii* in, 412; relationships of insects to hot spots in stored wheat in, 489; *Trypodendron lineatum* on Douglas fir in, 656
- Oreodoxa regia*, parasites and predators of *Timospa longissima* on, in New Caledonia, 560
- Orgilus obscurator*, effectiveness of, as parasite of *Rhyacionia buoliana* increased by nectar-bearing plants, 90
- Orius*, parasitising *Psylla pyricola* in California, 38; preying on *Heliothis zea*, 582
- Orius insidiosus*, preying on *Ostrinia nubilalis* on maize in United States, 275; predacious on eggs of *Heliothis zea* in Arkansas, 416
- Ormenaria rufifascia*, on fan-leaf palms in Florida, 543
- Orosius argentatus*, transmitting tomato big-bud virus, 223
- Orphulella punctata*, infestation and control of, on rice in British Guiana, 172
- Orthezia praelonga*, infection of, by *Colletotrichum gloeosporioides* and other fungi on *Citrus* in Brazil, 461
- Orthodibrom (see Naled)
- Ortho IPMC (see Arprocarb)
- Orthophosphates, automated determination of, 464
- Orthoptera, list of workers engaged in research on, 597
- Oryctes boas*, on coconut in Ivory Coast, 334
- Oryctes gigas*, on coconut in Ivory Coast, 334
- Oryctes monoceros*, biological control of, in Africa, 295; on coconut in Ivory Coast, 334; on coconut in Somalia, 380
- Oryctes nasicornis*, rearing of *Microphthalma europaea* on, 105
- Oryctes owariensis*, on coconut in Ivory Coast, 334
- Oryctes rhinoceros*, attacking *Elaeis guineensis* in Malaya, enemies of, 178; biological control of, in Pacific, 295; bionomics and control of, on coconut in India, control of, in Samoa, 313; new virus disease of, in Malaya, 536
- Oryzaephilus gibbosus* sp. n., found in cargo of coconut from East Africa, 295
- Oryzaephilus mercator*, infesting stored groundnuts in Nigeria, 110; infesting stored dates in Israel, 143; development of, on seed-borne fungi, 236
- Oryzaephilus surinamensis*, determination of resistance of, to  $\gamma$  BHC, factors affecting development of, 3; effects of gaseous tensions on mortality of adults of, 4; insecticides against, in stored sorghum in South Africa, 82; infesting stored dates in Israel, 143; attacking stored rice in British Guiana, 172; fumigants against, destroying *Cheyletus eruditus* in stored grain in Czechoslovakia, 201; control of, in stored rice in India, 215; susceptibility of, to insecticides, toxicity of synergised pyrethrum to, 225; susceptibility of, to  $\gamma$ -radiation, 252; effect of dose rate on response of, to  $^{60}\text{Co}$  gamma radiation, 253; control of, in stored barley in Britain, 255; silica gel protecting packaged food from, 277; overwintering in trees near granaries in Portugal, 387; fumigation against, in bagged wheat in India; infesting processed food bari in storage in India, 399; not associated with hot spots in stored wheat, 489; high-frequency electrical fields for control of, in stored wheat, 490; comparative effectiveness of fumigants against, in wheat in Kansas, 542; small strain of, in Far East, 601; attacking stored sunflower seeds in Yugoslavia, 602; insecticides against, 622; association of, with storage fungi, 623
- Oscinella conicola*, attacking cones of *Pinus taeda* and *P. echinata* in Arkansas, 303; distribution of, on pine in Maryland, 304
- Oscinella frit*, effects of cultured practices on populations of, 13; on maize in Soviet Union, 13, 17; low altitude flight of, in Britain, 233; flight of, in relation to age and ovary development, 291; comparison of damage by *Hylemya coarctata* and, on cereals, 294; measures for control of, infesting maize in Ukraine, 323; varietal susceptibility of barley and oats to, in Rumania, 462; effects of insecticides on, and natural enemies of, on oats in Britain, 467; insecticides against, infesting maize in Soviet Union, 633
- Oscinella frit pusilla*, insecticides against, infesting maize in Soviet Union, 633
- Osmotic Pressure, influence of, on development of *Ips* spp. and *Agrilus viridis*, 576
- Ostrinia nubilalis*, on hemp in Soviet Union, nature of damage to maize by, in relation to *Fusarium*, 17; factors affecting resistance of maize to, in U.S.A., 35; bionomics of, and insecticides against, on maize in Rumania, 91; granular endrin against, on maize in Iowa, 162; granules for control of, on maize in China, 221; effects of  $\gamma$ -radiation on ovarian tissues of, 238; insecticides against, on maize in Ontario, 267; effect of predators



- on populations of, on maize in United States, 274; grass of, attracting females of *Lydella grisescens*, artificial parasitisation of, by *Lydella grisescens*, 293; birds as predators of overwintering larvae of, in maize stalks in Arkansas, 302; *Lydella grisescens* parasitic in, in Minnesota, 305, 306; mechanics of infra-red cinematography of; microchamber for replicating photophases in diapause studies of, 404; distribution of egg-masses of, in maize fields in China, 439; effects of insecticide treatments against, on maize in Egypt, 472; application of *Bacillus thuringiensis* in capsule form against, on maize in Iowa, 492; role of 6-methoxybenzoxazolinone in resistance of maize to, 497; *Smithiavirus pectinophorae*, not transmitted to, 536; studies on reciprocal crosses between biotypes of, on maize in U.S.A., 587; damaging maize in Soviet Union, 633; survival of, on maize supplied with nitrogen and phosphorus in Ohio, 644
- Otiorynchus balcanicus*, bionomics of, and insecticides against, on strawberry in Bulgaria, 326
- Otiorynchus crataegi*, bionomics of, and insecticides against, on strawberry in Bulgaria, 326
- Otiorynchus ligustici*, dieldrin residues on forage crops from soil treatments against, in New York, 368
- Otiorynchus niger*, sexually controlled differences in susceptibility of, to insecticides, 565
- Otiorynchus ovatus*, bionomics of, and insecticides against, on strawberry in Bulgaria, 326; found in abandoned feeding sites of Tortricids in Poland, 603
- Otiorynchus rugosostriatus*, bionomics of, and insecticides against, on strawberry in Bulgaria, 326
- Otiorynchus sulcatus*, factors affecting fecundity of, on strawberry in British Columbia, 18; effect of plant nutrition on fecundity of, on strawberry in British Columbia, 268
- Ovatus crataegarius*, on apple in Poland, 139
- Ovex (see Chlorfenson)
- Ovicides, use and action of, against insects and mites, 184
- OW-9 (see 2-Chloro-ethyl 2-(2-(p-tert.-Butylphenoxy) isopropoxy)isopropyl Sulphite)
- Oxalic Acid, attractiveness of, to *Eurytoma roddi*, 57
- Oxalis stricta*, flea-beetles feeding on, 12
- Oxya velox*, attacking groundnut in India, 216
- Oxycanus*, *Metarrhizium anisopliae* isolated from, in New Zealand, 313; diazinon, trichlorphon and *Bacillus thuringiensis* tested against, in New Zealand, 484
- Oxycareneus hyalinipennis*, differing susceptibility to insecticides in, in Tunisia, 243
- Oxydemeton-methyl, comparative translocation of, against *Chaitophorus populellus*, 26; against *Contarinia* and *Megastigmus spermotrophus*, 44; treatment of cottonseed with, against *Tetranychus cinnabarinus*; tests of, against *Brachycolus noxius*, 83; in sprays against *Psylla uncaroides*, 180; in sprays against *Tetranychus telarius*, 232; in sprays against *Pissodes sitchensis*, 500; in sprays, resistance to, in *Tetranychus telarius*, 515; resistance to, in sprays against *Dasyneura pyri*, 515; toxicity of, to Tetranychid mites, 585
- Oxygen, effects of reduced tensions of, on Coleoptera in stored grain, 4; effect of depletion of, on insect survival in stored grain, 601
- Oxythioquinox, chemical definition of, 2; against *Panonychus ulmi*, 26; against *Tetranychus telarius*, 164; against *Panonychus citri* and *Phyllocoptruta oleivora*, 269; in sprays against *Panonychus ulmi*, 284, 381; suppression of *Panonychus ulmi* by, in sprays against *Podospaera leucotricha*, 498; against *Psylla pyricola*, 643; for controlling spider mites, *Psylla pyri* and mildew on fruit crops, 651, 652; against *Tetranychus telarius* and cucumber mildew; toxicity of, to *Phytoseiulus persimilis*, 652
- Oxythyrea funesta*, rearing of *Microphthalma europaea* on, 105

## P

- Pachnaeus litus*, on *Citrus* in Florida, 543
- Pachnaeus opalus*, on *Citrus* in Florida, 543
- Pachygonatopus minimus*, as parasite of *Macrosteles fascifrons* in North America, 156
- Pachylobius picivorus*, method for collecting adults of, 542
- Pachymerus chinensis*, reared on *Cicer arietinum*, 238
- Pachynematus itoi*, occurrence and parasites of, on larch in Japan, 660
- Pachynematus scutellatus*, outbreak of, on spruce in Czechoslovakia, 199
- Pachyneuron minutissimum*, hyperparasitism by, reared from *Rhopalosiphum insertum* and *Aphis pomi* on apple in Holland, 121
- Pachyneuron siculum*, parasitising *Chilocorus* larvae in Israel, 390
- Pachypsylla celtidismamma*, *Moserina maculata* parasitising, on *Celtis* in U.S.A., 115
- Pachypsylla celtidisvesiculum*, parasitised by *Moserina maculata* on *Celtis* in U.S.A., 115
- Pacific Islands, pests of coconut in, 56; biological control of *Oryctes rhinoceros* in, 295; Mycetophilids of, 523 (see also Mariana Is; Micronesia)
- Pactamycin, effects of, on reproduction of *Myzus persicae*, 496
- Paecilomyces eriophytis*, infecting mites, 49
- Paint, marking of *Anthonomus grandis* with, 46
- Pakistan, *Schistocerca gregaria* in, 16, 54, 111; *Simmondsius pakistanensis* gen. et sp.n. feeding on *Parlatoria oleae* on pine in, 295; *Tryporyza innotata* in, 481; course of infestation by *Schistocerca gregaria* in, 597
- Pakistan, East, *Aceria litchii* on litchi in, 145
- Pakistan, West, *Eurygaster integriceps* in; *Eurygaster testudinaria* in, 144; *Eurygaster integriceps* on wheat and barley in, 145
- Palaecrita vernata*, effects of cytoplasmic polyhedrosis on, 56
- Palm, *Bemisia tabaci* associated with sooty mould on, in Central America, 401; *Cerataphis variabilis* on, in Florida, 543-545;

- Hemisphaerota cyanea* on, in Florida, 543-545; *Ormenaria rufifascia* on, in Florida, 543-545; attacked by *Brontispa longissima* in New Caledonia, 560
- Palm, Areca (see *Areca catechu*)
- Palm, Bangalow (see *Archontophoenix alexandrae*)
- Palm, Oil (see *Elaeis guineensis*)
- Palm, Royal (see *Oreodoxa regia*, *Roystonea regia*)
- Palmitic Acid, gas chromatography of, in *Hypera variabilis*, 413; methyl esters of, inhibiting growth of *Gryllodes sigillatus*, 605
- Palmitoleic Acid, gas chromatography of, in *Hypera variabilis*, 413
- Palpita flegia*, on yellow oleander in Florida, 543-545
- Panama, *Aleurocanthus woglumi* in, 172; mites of subfamily Phytoseiinae in, 211
- Panasol AN-5, as solvent for malathion, toxicity of, to red pine, 36
- Pandamus*, *Nacoleia octasema* on, 177
- Pandemis corylana*, parasitism of, on apple in Italy, 330
- Pandemis dumetana*, bionomics and control of, on strawberry in Hungary, 617
- Pandemis heparana*, parasitism of, on apple in Italy, 330
- Pandemis limitata*, changes in population of, on apple in Ontario, 201
- Pangamic Acid, attractive to *Eurytoma roddi*, 57
- Pangola grass (see *Digitaria decumbens*)
- Panicum*, *Ostrinia nubilalis* migrating from, to maize in Soviet Union, 633
- Panicum maximum*, attacked by *Mocis repanda* in Venezuela, 212
- Panolis flammea*, *Trichogramma cacoeciae* egg parasite of, in Poland, 96; biological control of, on pine in Germany, 99; relation between pupal weight and egg numbers in, infesting pine in Germany, 655; egg parasitism of, by *Trichogramma embryophagum* in Germany, 659
- Panonychus citri*, measures against on grapefruit, 32; non-inclusion virus for control of, on orange in California, 167; effect of insecticides against *Phyllocoptruta oleivora* on, on *Citrus* in Yugoslavia, 257; toxicity of carbamoyloxy phosphorodithioates to susceptible and phosphorus-resistant strains of, 282; on *Citrus* in Venezuela, 287; studies on natural enemies of, as pest of *Citrus* in Formosa, 315; in Florida, 543-545; *Panonychus ulmi*, effect of water-stress on reproduction of, 23; acaricides against, 26; on apple in Ohio, 26; on pear in California, 38; bionomics of, on apple in Chile, 47; on apple in England, fungus disease of, 49; distribution of, on apple in Holland, 121; effect on predacious mites of control measures against, on plum in Germany, 121; effect on *Typhlodromus pyri* of sprays against; integrated control of, on plum in Germany; effect of sprays on population of, on apple in Holland, 122; distribution of, on fruit trees in Soviet Union, 141; on apple in Quebec, not affected by organic fungicides, 157; effects of *Bacillus thuringiensis* and captan on, on apple in Wisconsin, 168; paper chromatography to detect predation on, 206; sprays against, affecting *Tetranychus ulmi* in apple orchards in Ontario, 267; control of, on apple in California, 284; brushing machine used for sampling of, on peach, 285; winter control of, on plum in Bulgaria, associated with *Bryobia redikorzevi* on apple in Bulgaria, resistance to thiometon in, 325; on apple in Italy, 330; carbamate sprays in control of, on peach in Ontario, 352; integrated control of, on apple in Wisconsin, 360; insecticides against, on apple in Virginia, O,O-dimethyl S ((2-oxo-3-benzoxazolinyl)methyl) phosphorothioate reducing reproductive capacity of, 369; resistance to thioquinox in, methiocarb ineffective against, in Germany, 379; tests on control of, on apple in Lebanon, 381; sorbitol in relation to supercooling point of winter eggs of, in Norway, 424; effect of DDT and DNC on numbers of, on plum and apple in Poland, 453; effect of spray programmes on, and predators on apple in Britain, 470; suppression of, by fungicides against *Podosphaera leucotricha* on apple in New York State, 498; effects of sulphur preparations against, on apple in Germany, 522; methods for estimating populations of, on apple in Switzerland, 629; on plants in Poland, 633; susceptibility of apple varieties to, in Michigan; resistance to organophosphorous compounds in, 642; control of, on fruit trees in Italy, 651; control of, on apple in Holland, 652
- Panorpa communis*, feeding on diseased larvae of *Neodiprion sertifer* in Germany, 339
- Pantomorus cervinus*, on *Citrus* in Florida, 543-545; distribution map of, 617
- Pantomorus godmani* (see *Pantomorus cervinus*)
- D-Pantothenate, attractiveness of, to *Eurytoma roddi*, 57
- D-Pantothenic Acid, attractiveness of, to *Eurytoma roddi*, 57
- Pantrin (see Carbaryl)
- Papaipema nebris*, artificial parasitisation of, by *Lydella grisescens*, frass of, attracting females of *Lydella grisescens*, 293; *Lydella grisescens* parasitic in, in Minnesota, 305
- Papaya*, *Aphis gossypii* transmitting mosaic virus of, in India, 217;  $\gamma$ -radiation as quarantine treatment of, 284; pests of, in Somalia, 380; anti-Coccid sprays for use on, in Australia, 450; *Myzus persicae* and virus disease of, in Hawaii, 495
- Paper Chromatography, determination of insecticides by, 28, 93; in determining phenotypes of *Adelges prelli*, 124; to detect predation on mites, 206
- Papilio demoleus*, bionomics of, on *Citrus* in India, 216
- Papua and New Guinea, Territory of, insect pests of rubber trees in, 480
- Paracalacarus podocarpus*, on *Podocarpus* spp. in Florida, 543-545
- Paradesmus coarctatus*, attacking rubber trees in Territory of Papua and New Guinea, 480
- Paraffin, in artificial oviposition device for *Rhagoletis pomonella*; apples used in rearing *Conotrachelus nenuphar* treated with, 286



- Parafilm, in artificial oviposition device for *Rhagoletis pomonella*, 286
- Paralispe infernalis*, parasitic in *Lema* sp., in Delaware, 368
- Paralobesia viteana*, control of, on vines in Malta, 135
- Paramyelois transitella*, insecticides against, on almonds in California, 206; *Phanerotoma* spp. parasitic in, in California, 543
- Paranthrene tabaniformis*, insecticides against, on poplar, 127; on poplar in Spain, 128; infesting poplar in Soviet Union, 193
- Paranthrene tabaniformis synagrisformis*, in Spain, 128
- Paraaxon, inhibition of cholinesterase by, 117; effect of, on carboxyesterases of *Nephotettix cincticeps*, 546; toxicity of, to Tetranychid mites, 585; and Isolan, against *Drosophila melanogaster*, 599
- Parasitaphelenchus dendroctoni* sp.n., parasitic in *Dendroctonus adjunctus* in New Mexico, 537
- Parasitylenchus stipatus* sp.n., parasitic in *Dendroctonus adjunctus* in New Mexico, 537
- Paratetranychus pilosus* (see *Panonychus ulmi*)
- Parathion, against *Zeuzera pyrina*, 5; and DDT, residues of, on apple, 25; against *Hylemya brassicae*, 36; against *Chilo suppressalis*, 48; toxicity of, to *Cydia pomonella*, 75; tests of, against *Brachycolus noxius*, 83; toxicity of, to *Spodoptera littoralis*, 84; against *Aegeria myopaeformis*, 90; toxicity of, to pests of vegetables and fruit trees, 92; in tests against *Cydia pomonella*, 93; against *Cryptorhynchus lapathi*, toxicity of, to man, 94; against *Aphis fabae*, 98; susceptibility of *Drosophila melanogaster* to, 100; varietal susceptibility of *Tetranychus telarius* to, 117; and methyl-demeton, against pests of stone fruit, 122; effect of oil on persistence of, determined by bioassay of *Citrus* foliage, oil reducing toxicity of, to *Pauridia peregrina*; deposition of, on *Citrus*, 132; in sprays against *Myzus persicae* and *Aphis gossypii*; in sprays against *Rhopalosiphum erysimi*, 146; toxicity of, to *Phytoseiulus persimilis* and *Tetranychus telarius*, 154; toxicity of, to cyclodiene-susceptible and cyclodiene-resistant strains of *Hylemya antiqua*, 163; toxicity of, to *Tetranychus cinnabarinus*, 164; against *Conotrachelus nenuphar*, 165; resistance and susceptibility to, in *Tetranychus telarius*, 181; susceptibility of *Stenomalina muscarum* to, 182; and methyl-parathion, against *Lithocolletis pyrifoliella*, 195; in sprays against *Typhlocyba rosae*, 197; against *Lepidosaphes beckii*, 207; surface-active agents added to sprays of, against *Liriomyza munda*; and oil emulsion, in sprays against Coccids, 208; alone and with DDT, in sprays against *Acrobasis caryae*, 209; in sprays against *Apion corchori*, 213; in sprays against *Cydia pomonella*, in sprays against *Zeuzera pyrina*, 227; in sprays against *Stigmella malella*, 228; development of increased irritability to, in *Euxesta notata*, 236; in dusts against *Oxycaenus hyalinipennis*, 243; toxicity of, to *Amsacta moorei*, 259; persistence of spray residues of, on *Hibiscus*, 260; in spray against *Chilo partellus*, 262; alone and with adhesives, in sprays against *Labioproctus polet*, 263; against *Agrotis ipsilon* and *A. segetum*, 264; contact versus stomach toxicity of, to *Spodoptera littoralis*, 269; and DDT in sprays against cotton insects, 272; contaminating rooms and equipment used for rearing *Cydia molesta*, 275; swollen abdomens in insects treated with, 276; and Dilan in sprays against *Psylla pyricola*, 282; automatic analysis of, in waterplants, 296; resistance to, in *Chilo suppressalis*, 315; toxicity of, to adults and larvae of *Dacus cucurbitae*, 316; toxicity of, to *Aonidiella aurantii*, 317; toxicity of, to *Oligonychus indicus*, 318; in sprays, against *Pseudococcus comstocki*, not harmful to predators and parasites of *Pseudococcus comstocki*, 320; in sprays with dinoseb-ammonium, against *Panonychus ulmi*, 325; applied to plants, or as deposits against *Otiiorhynchus* spp., 326; against *Rhagoletis cerasi*, 328; in sprays, against Tipulid larvae, 329; and oleoparathion, in sprays, against *Archippus oporaneus*, 330; with malathion and in oil emulsion, against *Heterarthrus ochropodus*, 331; against *Tetranychus cinnabarinus* harmful to beneficial mites, 337; resistance to, in *Tetranychus telarius*, 350; in sprays against *Argyrotaenia velutinana*, persistence of, on grape foliage, 358; in granules, against *Limoniulus canus*, 366; in sprays against *Coccus deliae*, 376; in sprays against *Panonychus ulmi* and *Cydia pomonella*, 381; in sprays against *Thomasinia theobaldi*, 382; and oil emulsion, in sprays against Coccids, 390; phytotoxicity of, to oranges, in sprays against *Aonidiella aurantii*, 393; determination of residues of, in acid oils, 394; in dusts against *Scirtothrips bispinosus*, 397; effectiveness of, in stored pine sapwood against termites, 408; alone and with DDT, effective in sprays against *Aporia crataegi*, 439; in sprays against *Cydia lufabrana*, 454; in sprays against *Scaphioideus litteralis*, 458; residues of, in plants used against *Tetranychus telarius*, 461; method for determining residues of, 465; effect of, on *Oscinella frit*, 467; and toxaphene or endrin, toxicity of, to *Spodoptera littoralis*, 472; effect of temperature on, against *Cotinis nitida*, 485; toxicity of, to *Hylemya brassicae*, 493; in sprays against Aleyrodids, 510; soil treatment with and in dusts, against *Hylemya* spp., 511; resistance to, in *Tetranychus telarius*, 515; residues of, on lettuce under glass, 518; in sprays against *Pegomya betae*, 551; in diesel oil or tar distillate, against *Phenacoccus mespili*, 553; in sprays, against *Eurygaster integriceps*, 554; in sprays, against *Phyllotreta cruciferae*, 555; in sprays against *Cladius pectinicornis*, 556; applied in sprays, sexually controlled differences in susceptibility of *Otiiorhynchus niger* to, 565; toxicity of, to Tetranychid mites, 585; against *Aegeria pictipes*, 590; and Isolan, against *Drosophila melanogaster*, 599; in dusts, against *Lema* spp. and other Criocerids, 606; and mineral oil, in sprays against *Cryptoblabes gnidiella*, 608; and DDT, in sprays

- against *Gymnoscelis pumilata*, 608; and mineral oil, in sprays against *Cadra cautella*, 609; alone and with BHC, soil treatment with, against *Planococcus lilacinus*, 614; in sprays against *Chilo suppressalis*, *Tryporyza incertulas* and *Sesamia inferens*, 615; alone and with DDT, in sprays against *Trioza tremblayi*, 627; used in sprays against aphids, method for assessing effect of, on fauna of fruit trees, 629; in sprays against *Oscinella* spp., 633; in dusts against *Phyrdenus muriceus*, 639; in sprays against *Hypocala andremona*, 639; in sprays against *Bryobia rubrioculus*, 640; mite resistance to, 642; development of resistance to, in *Psylla pyricola*, 643; resistance to, in *Myzus persicae*, 650; alone and with oil emulsions against *Psylla pyri*, 651; effect of, on blood cells of *Periplaneta americana*, *Poecilocerius pictus*, and *Samia cynthia ricini*, 662; for protection of stored potatoes from *Phthorimaea operculella*; in sprays against *Aleurolobus barodensis*, 664
- Paratrioza cockerelli*, insecticides against, on potato in Arizona, 268
- Parazitan (see DDT)
- Paridalaspis cosyra*, terpinyl acetate attracting isolated males of, on guava in South Africa, 130
- Parectopa robiniella*, natural enemies of, 116
- Parerupa africana*, in Africa, 481;
- Parinari excelsa holstii*, attacked by Lamiids in East Africa, 444
- Paris Green, in bran baits against Tipulid larvae, 329
- Parisotoma notabilis*, *Hypoaspis aculeifer* on, in Canada, 308
- Parlatoria*, on *Citrus* in Somalia, 380
- Parlatoria blanchardii*, chemical control of, on date palm in Israel, 144
- Parlatoria cinerea*, on orange in Brazil, 377
- Parlatoria oleae*, *Simmondsius pakistanensis* gen. et sp.n. feeding on, on *Pinus excelsa* in Pakistan, 295; control of, on plums in Italy, 328; winter control of, on apple and apricot in Italy, 390; *Chilocorus bipustulatus* predacious on, on olive in California, 543
- Parlatoria pergandii*, sprays against, on *Citrus* in Florida, 207
- Paropsis atomaria*, growth and food consumption during larval stages of, on *Eucalyptus blakelyi* in Australia, 292
- Parsnip, tolerance of, to methyl bromide fumigation and hot water treatments, 180; effects of soil applications of DDT and aldrin on, 231
- Parsnip, Cow (see *Heracleum lanatum*)
- Parthenolecanium* (see *Eulecanium*)
- Parus*, as predator of *Cydia conicolana*, 651
- Paspalum*, *Oncopera* spp. on, in Queensland, 484
- Passer domesticus*, *Ptinus tectus* in nests of, 601
- Pastinaca intermedia*, relation of, to effectiveness of primary parasites of *Rhyacionia buoliana*, 90
- Patasson chrysomelae*, parasitic in eggs of *Chysomela americana* in Italy, 331
- Patasson conotracheli*, overwintering in eggs of *Hypera variabilis* in U.S.A., 359
- Pauridia peregrina*, oil reducing toxicity of insecticides to, 132
- Paurocephala gossypii*, occurrence of, on cotton in Malawi, 475
- PCNB (see Pentachloronitrobenzene)
- PCPCBS (see Fenson)
- Pea, effect of, on populations of *Oscinella frit*, 13; nutritional value of, to *Macrosiphum pisum*, 66; *Melolontha melolontha* on, in China, 89; losses caused by *Cydia nigricana* on varieties of, in Sweden, 181; *Contarinia pisi* on, in France, 226; effects of soil applications of DDT and aldrin on, 231; *Callosobruchus maculatus* on, in China, 264; protection of, from pests in Soviet Union, 319; *Sitona* spp. on, in Soviet Union, 321; *Myzus persicae* as vector of mosaic virus in, 324
- thrips on, in Holland, 341; persistence of dimethoate on, and aphids on, in U.S.A., 363; chloropicrin residues in, after chamber fumigations, 375; pests of, in Britain, 386; *Lampides boeticus* on, in Tunisia, 393; bromide residues from methyl bromide fumigations of, 419; *Sitona* spp. on, in Israel, 447; transmission of virus disease by aphids to, 492; *Macrosiphum pisum* on, in Canada, uptake of disulfoton by, 534; *Sitona* spp. damaging, in Soviet Union, seed treatments for, 550; insect pests on, in Iraq, 584; *Macrosiphum pisum* on, in relation to predators, 646; *Macrosiphum pisum* on, in New Mexico, 647
- Pea, Pigeon (see *Cajanus cajan*)
- Pea, Southern (see *Vigna unguiculata*)
- Pea, Sweet (see *Lathyrus odoratus*)
- Pea (Stored), no breeding of *Sitophilus granarius* in, 5; detection of insects in, 118
- Peach, *Lachnosterna bruneri* on, in Florida, 47; aphids on, in Italy, 103; integrated pest control on, in France, 123; aphids overwintering on, in South Africa, 131; *Conotrachelus nenuphar* on, in Ohio, 165; *Eulecanium* spp. on, in Ontario, 204; *Dacus* spp. on, in India, 214; *Prospaltella perniciosi* parasitising *Quadraspidiotus perniciosus*, on in France, 225; fruit-flies on, in Brazil, 241; pests of, in Brazil, leaf rust caused by *Tranzschelia pruni-spinosae* on, in Brazil, 243; resistance of, to *Aegeria exitiosa*, 267; sampling *Panonychus ulmi* on, 285; *Anarsia lineatella* and *Cydia molesta* on, in Europe and Mediterranean Basin, 333; insecticidal control of pests of, in Ontario, 352; *Aegeria pictipes* on, in Ontario, 353; *Ceratitis capitata* on, in Argentina, 376; pests of, in Portugal, 387; Coccids on, in Italy, 390; *Tetranychus telarius* on, 484; *Aegeria pictipes* on, in Virginia, 590; *Ceratitis capitata* on, in Israel, 613
- Pear, *Cydia pomonella* on, in Iran, 10; pests of, in California, 38; *Campylomma verbasci* on, in U.S.A., 46; *Psylla pyricola* on, in California, transmitting virus disease of, 55; *Eriophyes pyri* on, in Turkey, 83; *Aphis pomi* in relation to fire blight of, 117; integrated control measures for, in Holland, 122; insect pests of, in Malta, 135; residues of lead and arsenic in, 183; *Hoplocampa brevis* on, in North America, 210; *Dacus* spp. on, in



- India, 214; *Prospaltella perniciosi* parasitising *Quadraspidiotus perniciosus* on, in France, 225; treatment of, for control of *Zeuzera pyrina* in France, 228; *Hoplocampa brevis* on, in Canada, 239; tainting of, by pesticides, 240; *Ceroplastes sinensis* on, in Italy, 246; *Neurotoma flaviventris* transferring from, to cherry in Yugoslavia, 257; effect of rootstock on susceptibility of, to *Psylla pyricola*, 282; *Archippus oporanthus* on, in Italy, 330; *Epidiaspis leperii* on, in Italy, 390; *Pelecomalium testaceum* on flowers of, in British Columbia, 421; insecticide residues on, 461; aphids on, in Soviet Union, 508; *Dasyneura pyri* on, in Poland, 515; *Janus compressus* on, in Bulgaria, 556; *Lithocolletis corylifoliella* on, in Holland; growing points of, attacked by *Cnephasia longana* in Holland, 568; transfer of radioactive components by *Psylla pyricola* to, 621; *Psylla pyricola* on, in Washington State, 643; *Psylla pyri* on, in Italy, 651
- Pecan, *Acrobasis caryae* on, in Florida, 209; insects and diseases of, in Florida, 463
- Pectinophora gossypiella*, on cotton in U.S.A., diet for, light-trap catches of, 30; metepa as chemosterilant for, effect of sterilisation on mating competitiveness of, 35; bionomics of, on cotton in U.S.A., 63; mating habits of, 66; *Diatraea saccharalis* reared on diet for, 166; insecticides against, on cotton in Colombia, 211; control of, on cotton in India; insecticides against, on cotton in India, 215; attacking cotton in Spain, 256; genetic factors involved in diapause of, 305; factors affecting winter survival of, cotton fields in Texas, 365; on cotton in Somalia, 380; on cotton in Yugoslavia, 392; infra-red irradiation of overwintering larvae of, in China, 463; control measures against outbreaks of, on cotton in Rhodesia and Malawi, overwintering on *Hibiscus dongolensis*, 475; in okra pods in Texas, 499; method for mass rearing, on artificial diet, solvents for sex attractant of, 500; on cotton in Iran, 519; *Smithiavirus pectinophorae* isolated from, in U.S.A., 536; traps for and attempted control of, by male annihilation in cotton fields in Mexico, 589; effect of fluctuating temperature on diapause induction in, 604; decline in importance of, as cotton pests in the Sudan, 656
- Pediasia mutabilis*, control of, in Kentucky, 269
- Pediasia teterrella*, control of, in Kentucky, 269
- Pediasia trisecta*, control of, in Kentucky, 269
- Pediobius politus*, parasitic in *Lithocolletis blancardella* in Rumania, 328
- Pediobius pyrgo*, association of, with *Contarinia sorghicola* in Italy, 389
- Pegomya betae*, mass rearing of, 53; disulfoton effective against, in Poland, 140; bionomics and control of, on beet in Soviet Union, 194; factors causing outbreaks of, on beet in France, 224; insecticide control of, on sugar-beet in Britain, 386; on beet in Iran, 519; control measures against, damaging sugar-beet in Soviet Union, 551; disulfoton granules against, on beet in Switzerland, 577
- Pelargonium*, resistance to *Tetranychus telarius* in species, varieties and hybrids of, 296
- Pelecomalium testaceum*, damaging flowers of fruit trees and bushes in British Columbia, 421
- Pemphigus bursarius*, infesting crucifers in Poland, 139; effect of windbreak on distribution of, on lettuce in Britain, 335
- Penicillium cyclopium*, feeding and oviposition of *Cryptolestes ferrugineus* on, 540
- Penicillium funiculosum*, feeding and oviposition of *Cryptolestes ferrugineus* on, 540
- Penicillium terrestre*, feeding and oviposition of *Cryptolestes ferrugineus* on, 540
- Pennisetum*, factors governing storage of, in Nigeria, 50; *Schistocerca gregaria* on, in Ethiopia, 51; *Criocerids* on, in Africa, 606
- Pennisetum clandestinum*, *Oncopera* spp. on, in Queensland, 484
- Pennisetum* (Stored), contamination with γ-BHC in, in Nigeria, 133
- Pennsylvania, *Argyrotaenia velutinana* on grape vines in, 358; *Patasson conotracheli* overwintering in eggs of *Hypera variabilis* in, 359; *Tiphia vernalis* as parasite of *Popillia japonica* in, 369; *Macrosiphum pisum* parasitised by *Aphidius smithi* in, 501
- Pentachloronitrobenzene, and captan applied with systemic insecticides, no adverse effects with, 641
- Pentachlorophenol, toxicity of, to larvae of *Hylotrupes bajulus*, 405; treatment of cotton with, against overwintering population of *Anthonomus grandis*, 580
- Pentalitomastix nacleiae*, released against *Nacleia octasema* on banana in Fiji, 177
- Pentatoma rufipes*, on apple in Poland, 95
- Pentodon punctatus*, rearing of *Microphthalmus europaea* on, 105
- Pentosans, effect of, on development of *Anthonomus punctatum*, 181
- Pepper (see *Piper*)
- Pepper, Black (see *Piper nigrum*)
- Peppers, (see *Capsicum*)
- Peregrinus maidis*, virus disease of maize transmitted by, in Venezuela, 300; in relation to climatic factors, parasites and predators of, in Venezuela, 300
- Perfekthion (see Dimethoate)
- Perga affinis affinis*, macro- and micro-distribution of, in New South Wales and Victoria, 403
- Periclista albipennis*, *Periclista andrei* misidentified as, in Portugal, 460; *Periclista andrei*, bionomics and parasites of, on *Quercus* spp., in Portugal, 460; *Periclista dusmeti*, parasites of, on *Quercus suber* in Portugal, 295; bionomics and parasites of, on *Quercus* spp., in Portugal, 460
- Pericoptus truncatus*, *Metarrhizium anisopliae* isolated from, in New Zealand, 313
- Perilampus*, parasitising *Doryphorophaga doryphorae*, 459
- Perilampus microgastris*, parasitising *Phanerotoma* and *Devorgilla* spp., in India, 662
- Perilitus*, parasitising *Eleodes suturalis*, 270
- Perilitus coccinellae*, bionomics of, parasitising Coccinellids in France, 104

- Perilloides bioculatus*, introduced into Soviet Union against *Leptinotarsa decemlineata*, 15; food requirements of, 575
- Periplaneta americana*, laser effects on, 23; as textile pests, 125; toxicity and metabolism of, O,O-dimethyl O-p-dimethylsulphamoyl-phenyl phosphorothioate in, 188; action of DDT on nerve of, 418; metabolism of dimethyl 1-methylcarbamoyl-1-propen-2-yl phosphate by, 507; *Smithiavirus pectinophorae* not transmitted to, 536; effect of insecticides on blood cells of, 662
- Periplaneta australasiae*, records of, infesting textiles in Germany, 521
- Perniphora robusta*, in relation to *Trypodendron lineatum* in Poland, 98
- Persea*, *Trioza magnoliae* on, in Florida, 543-545
- Persea indica*, interactions between *Amblyseius hibisci* and *Oligonychus punicae* on, 648
- Persimmon, fruit-flies on, in Brazil, 241; *Hypocla andremona* on, in Brazil, 242; *Trioza diospyri* on, in Florida, 543-545; *Hypocla andremona* on, in Brazil, 639
- Perthane (see Ethyl-DDD)
- Peru, *Dicranoctetes saccharella* on sugar-cane in, 194
- Pesticides, formulation and guide to, 246; research needs and approaches to use of, from public health viewpoint, 247-249; relation between structure and activity in investigation of action of; responses of mammalian species to; synergism and antagonism of; evaluation of, for carcinogenicity; effect of, on man; effect of, from land drainage in farm pond waters; in sea water; in public water supplies; persistence and removal of in foods, 248; handbook of, for treatment of fruit trees, 288; supplement to a review of hazards of, 619 (see also Insecticides)
- Pestox 3 (see Schradan)
- Petrobia harti*, on *Indigofera teysmanni* in India, 663
- Petrobia latens*, infestation and control of, on crops in Queensland, 449
- Petrolatum, in artificial oviposition device for *Rhagoletis pomonella*, 286
- Petroleum-Ether, used in extraction of *Melia azedarach*, 218; used in extractions of rice bran, 548
- Peucedanum graveolens*, oil of, as attractant for insect pests, 399
- Pexicopia malvella*, on cotton in Iran, 519
- Phaedon cochleariae*, toxicity of compounds of pyrethrum to, 112
- Phaenobremia*, occurrence and bionomics of, in Britain, 569
- Phaogenes invisor*, parasitising *Tortrix viridana* on oak in Europe, 123; parasitising *Archips crataeganus* on oak in Czechoslovakia, 199; parasitising *Tortrix viridana*, 426
- Phaogenes laricellae*, attacking *Argyresthia laricella* in New Brunswick, 502
- Phanerotoma*, parasitic in *Cydia toreuta*, 596; parasitising *Orthaga* sp., on *Syzygium fruticosum* in India, parasitised by *Perilampus microgastris* in India, 662
- Phanerotoma flavitestacea*, establishment of, against *Paramyelois transitella* in California, 543
- Phanerotoma inopinata* sp. n. parasitic in *Paramyelois transitella* in California, 543
- Phaonia nigricans*, parasitising *Cephalcia fascipennis* on spruce in Canada, 153
- Pharoscygnus numidicus*, toxicity to, of insecticides used against *Parlatoria blanchardii*, 144
- Phuseolus aureus*, growth of *Callosobruchus chinensis* and *Zabrotes subfasciatus* on, 150; as ingredient in processed food bari, 399
- Phaseolus lunatus* (see Lima Beans)
- Phaseolus mungo*, as ingredient in processed food bari, 399
- Phaseolus vulgaris* (see Beans)
- Pheasant, esterase inhibition in, poisoned by phorate, 524; effect of  $\gamma$  BHC seed dressing on, in Britain, 618
- Pheidole megacephala*, in relation to aphids on apple in Rhodesia, toxicity of insecticides to, 73; preying on *Tetrastichus brontispae* and *Brontispa longissima* in New Caledonia, 560
- Phenacaspis cockerelli*, on ornamental shrubs in Florida, 543-545
- Phenacoccus mespili*, chemical control of, on fruit trees in Soviet Union, 553
- Phenkapton, toxicity of, to *Cydia pomonella*, 75; in sprays against *Tetranychus telarius*, 232, 247; effect of, in combined sprays against cotton worms and spider mites, 474
- Phenthoate, against *Zeuzera pyrina*, 5; against *Cydia pomonella*, 6, 10; against *Bryobia praetiosa*, 10; toxicity of, to *Spodoptera littoralis*, 84; toxicity of, to pests of vegetables and fruit trees, 92; against *Cydia pomonella*, 93; method for determining residues of, in apple, 93, 94; methods of determining residues of, in olive oil or olives; tests of, against *Cryptorhynchus lapathi*; tests of, against Coccids, against *Lobesia botrana*, 195; in sprays against *Cydia pomonella*, 227; in sprays against *Cydia leucostoma*, 397; in sprays against *Scirtothrips bispinosus*, 397, 398; in sprays against *Oligonychus coffeae* and *Calacarus carinatus*, 398; in sprays against *Bryobia rubrioculus*, 640
- $\beta$ -Phenylethylamine, stimulating oviposition by *Hylemya brassicae*, 289
- Phenyl Methylcarbamate, effects of structure on biological activity of, 420
- Phenyl N,N'-I imethylphosphorodiamidate, against *Chaitophorus populellus*, 27
- Pheromones, use of, in insect control, 288
- Philaenus spumarius*, *Ballota* split-leaf virus transmitted by, in Britain, 232
- Philippine ls., *Spathius helle* parasitising *Chilo suppressalis* in, 60; *Anonaepestis bengalella* on *Annona squamosa* in, 74; *Nephotettix* sp. in, 87; *Dacus cucurbitae* on *Momordica charantia* in, 265; catalogue and bibliography of Hymenoptera in, 463; transmission of leaf curl disease of tobacco by *Bemisia* in; *Citrus* pests and their control in, 480; Tachinids parasitising *Spodoptera mauritia* in; control of *Acrocercops cramerella* on cacao in; biological control of rice stem



- borers in, **481**;  $\gamma$  BHC against *Chilo suppressalis* harmful to freshwater fish in rice fields in, **494**; control of pests of rice in, **615**
- Phlegethontius*, synonym of *Manduca*, **545**
- Phleum pratense*, Thysanoptera on, in Germany, **101**; Auchenorrhyncha and Heteroptera on, in Sweden, **345**; *Thymelicus lineola* on, in Ontario, **350**
- Phloeonomus*, abundance of, in relation to *Myelophilus piniperda* in Finland, **383**
- Phloeosinus thujae*, damaging *Thuja* in Holland, **178**
- Phobetes thyriderpteryx*, parasitising *Itopectis conquisitor* in Virginia, **29**
- Phoenix canariensis*, *Aphytis africanus* reared from *Lindingaspis rossi* on, in South Africa, **130**
- Phoma herbarum medicaginis*, *Macrosiphum pisum* in relation to infection of lucerne by, **26**
- Phoracantha recurva*, *Megalyra fasciipennis* associated with, in felled timber in South Africa, **131**
- Phoracantha semipunctata*, bionomics of, on *Eucalyptus* in Turkey, **83**; *Megalyra fasciipennis* associated with, in felled timber in South Africa, **131**; damaging *Eucalyptus* spp. in Tunisia, **245**
- Phorate, persistence of, in soil; against *Psila rosae* and *Hylemya brassicae*; against aphids; effects of, on soil organisms, **80**; toxicity of, to *Coccinella septempunctata*, **85**; seed treatments with, **111**; as drenches against *Macrosiphum solani*, **160**; in granules against *Mayetiola destructor*, **163**; in granules against *Tetranychus telarius*, **164**; seed treatment with, and in granules against thrips, **165**; synergism of, against *Anthonomus grandis*, **169**; effect on cottonseed of soil treatment with, **242**; seed-furrow treatment with granules of, against *Atherigona indica*, affecting germination of sorghum, **262**; soil treatment with, in granules against *Paratiroza cockerelli* and *Myzus persicae*, **268**; effect of seed treatments with, on cotton and cotton insects, **272**; against cotton pests, **278**; in granules against *Macrosteles fascifrons*, **285**; soil treatment with, in granules against *Gossyparia spuria*, **286**; in granules, against *Quesada gigas*, **299**; toxicity of, to *Aonidiella aurantii*, **317**; toxicity of, to *Oligonychus indicus*, persistence of, on plants, **318**; as side-dressings, against *Myzus persicae*, **355**; in granules, against *Limoniulus canus*, **366**; in granules against *Diabrotica undecimpunctata howardi* and *Phyllotreta pusilla*, effects of, on plants, **414**; in granules against *Tetranychus marianae*, effects of, on plants, **415**; against resistant strains of *Hylemya brassicae*, **420**; soil treatment with, in granules against aphids, **469**; toxicity of, to *Hylemya brassicae*, **493**; in granules against *Blissus leucopterus*, **499**; esterase inhibition in pheasant poisoned by, **524**; against *Rhopalosiphum padi*, volatility and ability of, to move through soil, in relation to absorption of, by wheat, **532**; seed treatments with, against *Sitona* spp., and effect of, on plants, **550**; in granules, charcoal dust and seed treatment with, against *Thrips tabaci* and *Phytomyza atricornis*, **584**; apparent increases in *Capitophorus fragaefolii* caused by, **588**; seed treatment with, in granules against cotton pests, **589**; and herbicides, effect of, on cotton seedlings, **596**; in granules against thrips; harmful interaction between fungicides and, **641**
- Phorocera claripennis*, parasitising *Mocis repanda* in Venezuela, **212**
- Phosalone, chemical definition of, **2**; in sprays against *Cydia pomonella*; in sprays against *Zeuzera pyrina*, **227**; in sprays against *Stigmella malella*, **228**; against *Hypera variabilis*, **580**
- Phosdrin (see Mevinphos)
- Phosphamidon, against *Panonychus ulmi*, **26**; effects of, on bioassay of Bidrin, **28**; against *Psylla pyricola*, **38**; against *Lambdina fuscilaria lugubrosa*, **42**; against *Contarinia* and *Megastigmus spermotrophus*, **44**; against *Chilo suppressalis*, **48**; against *Leptinotarsa decemlineata*, **52**; toxicity of, to *Coccinella septempunctata*, **85**; and oil emulsion, against *Parlatoria blanchardii*, toxicity of, to *Pharoscymnus numidicus*, **144**; in sprays against *Myzus persicae*, **166**; in sprays against *Enarmonia formosana*, **230**; in spray against *Alabama argillacea*, **243**; against *Phyllocoptruta oleivora*, **257**; in sprays against *Chemoiphila salicella*, **267**; toxicity of, to adults of *Dacus cucurbitae*, **316**; toxicity of, to *Oligonychus indicus*, **318**; in sprays against apple pests, **360**; tests of, in sprays against aphids, **386**; against *Helopeltis theivora*, **397**; in sprays against *Oligonychus coffeae* and *Calacarus carinatus*, **398**; in control of *Cydia pomonella*, **448**; in sprays against *Petrobia latens*, **449**; in sprays against *Pissodes sitchensis*, **500**; in sprays against *Phytomyza atricornis*, **584**; toxicity of, to Tetranychid mites, **585**; and Isolan, against *Drosophila melanogaster*, **599**; against *Ceratitidis capitata*; tests of, against *Phthorimaea operculella*, **613**; alone and with BHC, soil treatment with, against *Planococcus lilacinus*, **614**; in sprays against *Neodiprion taeda linearis*, **643**; resistance to, in *Myzus persicae*, **650**; effect of on blood cells of *Periplaneta americana*, *Poecilocus pictus* and *Samia cynthia ricini*, **662**
- Phosphorothiono Insecticides, chromatographic and cholinesterase detection of, **404**
- Phosphorus, colorimetric determination of, **92**, **93**, **94**; resistance to, in *Panonychus citri*, **269**; effect of, in groundnut plants on fecundity of *Aphis craccivora*, **317**; detection of, in pesticides by microcoulometric gas chromatography, **404**
- Phosphorus (as plant nutrient), effect of, on *Tetranychus telarius*, **484**; effects of, on survival of *Ostrinia nubilalis*, **644**
- Phosphorus, Radioactive, insecticides labelled with, **28**; in studies of chemosterilant, **39**; use of, with insecticides, **92**, **93**, **94**; dimethoate labelled with, **116**; uptake of, by aphid vectors of beet-yellows virus, **229**; as tracer, insecticides labelled with, **357**; use of, in investigations with *Bacillus thuringiensis*,

- Bacillus thuringiensis* labelled with, 425; dimethoate labelled with, 532
- Phostoxin (see Hydrogen Phosphide)
- Photoperiod, in relation to susceptibility of *Anthonomus grandis* to methyl-parathion, 71; effects of, on sexual maturation of *Locusta migratoria*, 119; in development of *Neodiprion sertifer*, 158; effect of, on *Eumerus strigatus*, 192; response to, in *Amblyseius similis*, 293; device for controlling for studies on *Hypera variabilis*, 296; influence of, on diapause in *Heliothis* spp.; influence of, on diapause in *Protoparce sexta*, 306; effects of, on *Brevicoryne brassicae*, 332; effects of, on mating and oviposition of *Diatraea saccharalis*, 411; effect of, on fatty acid composition of *Hypera variabilis*, 413; effects of, on diapause in Lepidoptera, 434; effects of, on development of *Pieris napi* and *Pieris rapae*, 437; effect of, on development of winged forms in *Brevicoryne brassicae*, 438; effects of, on development of *Adoxophyes orana*, 547; effect of, on *Ostrinia nubilalis*, 587; influence of, on imaginal diapause in *Nomadacris septemfasciata*, 604; effect of, on diapause in *Coeloides brunneri*, 605; geographic variation in, for *Neodiprion sertifer*, 616; variable in constant temperature chamber, 619; effect of, on diapause of *Gryllus campestris*, 622; effects of, on diapause of *Athalia glabricollis*, 632
- Phragmataecia*, wood-boring species of, in Indo-Malayan region, 178
- Phragmites*, *Aphidius transcaspicus* against *Hyalopterus pruni* on, in Czechoslovakia, 391
- Phragmites communis*, alternative food-plant of *Hyalopterus amygdali*, 103
- Phrydiuchus*, food-plant relations of, 273
- Phrydiuchus topiarius*, food-plant relations of, 273
- Phryganidia californica*, virus diseases of, 18
- Phryxe caudata*, parasitism by, not affected by dust against *Thaumetopoea pityocampa* on pine in Spain, 127; parasitising *Thaumetopoea pityocampa* on pine in Portugal, 295
- Phthorimaea absoluta*, parasitised by *Arrenoclavus koehleri*, on tomato in Chile, 377
- Phthorimaea operculella*, control of, on potato in Malta, 135; fumigation of stored potatoes against, in China, 264; tests with antifeeding compounds against larvae of, on potato and egg-plant in Israel, 339; resistance or susceptibility to insecticides in, on tobacco and potato in Queensland, 449; damaging potato in Israel; insecticides against, on egg-plant, 613; protection of stored potatoes from, in India, 664
- Phycita torrenti*, on *Quercus ilex* in Spain, 255
- Phygadeuon wiesmanni*, parasitising *Rhagoletis cerasi* on cherry in Poland, 138; *Rhagoletis cerasi* attacked by, 617
- Phyllobius brevis*, found in abandoned feeding sites of Tortricids in Poland, 603
- Phyllobius oblongus*, feeding inhibitors and food preference in, 290
- Phyllocnistis suffusella*, on *Populus nigra* in Germany, 60
- Phyllocoptes*, sprays against, on vines in Soviet Union, 509
- Phyllocoptruta oleivora*, bionomics and control of, on *Citrus* in Yugoslavia, 257; insecticides against in California, 269; on *Citrus* in Venezuela, 287; on *Citrus* in New South Wales, 315; on *Citrus* in Italy, 331; as pests of *Citrus* in Argentina and Uruguay, 376; on *Citrus* in Florida, 543-545
- Phyllognathus silenus*, natural enemies of, in Algeria, 105; *Sancassania* from larvae of, 345
- Phyllotreta*, damaging beet in Soviet Union, 194
- Phyllotreta cruciferae*, bionomics and control of, attacking crucifers in Bulgaria, 555
- Phyllotreta pusilla*, granular systemic insecticides against, on turnips in Texas, 414
- Phyllotreta striolata*, resistance of commercial crucifer varieties to, in North Carolina, 524
- Phyllotreta vittula*, damaging beet in Soviet Union, 194; insecticides against, damaging maize in Soviet Union, 633
- Phylloxera vitifoliae*, damage caused by, on resistant and susceptible hybrid vines in France, 457; control measures against, infesting vines in Soviet Union, 634
- Phyrdenus muriceus*, bionomics of, and insecticides against, on potato in Brazil, 639
- Physalis floridana*, used in experiments on virus transmission by *Myzus persicae*, 338
- Physcus odonaspidis*, parasitising *Odonaspis secreta* in Japan, 87
- Physiology, of insects, 297
- Physocephala vittata*, infesting honey bees in Soviet Union, 437
- Phytagromyza populi*, on *Populus nigra* in Germany, 60
- Phytatry, 17th International symposium on, 574-578
- Phytobia*, damaging poplar in Holland, 178
- Phytodecta fornicata*, feeding inhibitors and food preference in, 290
- Phytodietus segmentator*, parasitising *Tortrix viridana* on oak in Europe, 123; parasitising *Tortrix viridana*, 426
- Phytomyza atricornis*, distribution map of, 401; control of, on pea in Iraq, 584
- Phytomyza heringiana*, parasitism of, on apple in Italy, 330
- Phytomyza ilicicola*, wing-vein abnormality in, on *Ilex opaca* in U.S.A., 540
- Phytomyza lateralis*, evaluating damage by, to chicory in the forcing bed in Belgium, 575
- Phytomyza rufipes*, treated rape crops not effective against, in Germany, 339
- Phytophaga carpophaga*, on *Picea glauca* in Alaska, 21
- Phytopharmacy, 17th international symposium on, 574-578
- Phytoptipalpus albizziae*, on *Albizia procera* in India, 663
- Phytoseiidae, generic concepts in family of, 205
- Phytoseiinae, in Central America, 211
- Phytoseiulus persimilis*, predacious on other mites in Chile, 47; toxicity of insecticides to, 154; against *Tetranychus telarius* on cucumber in Britain, 236; use of, against *Tetranychus telarius* in California, 365; effect on, of chemicals against *Tetranychus telarius*, 652



- Phytoseius macropilis*, effect on, of control measures against *Panonychus ulmi* on plum in Germany, 121; on plants in Poland, 633
- Picea engelmanni*, *Hylastes annectens* on, in Colorado, 67; *Cephalcia fascipennis* on, in Canada, 152; *Ips hunteri* and *Ips utahensis* on, in U.S.A., 310
- Picea glauca*, *Choristoneura fumiferana* on, in British Columbia, 18; pests of, in Alaska, 21; *Cephalcia fascipennis* on, in Canada, 152; effects of chemical stimuli on feeding behaviour of *Choristoneura fumiferana* on, 158; *Ips perturbatus* on, in Canada and U.S.A., 310; *Enarmonia ratzeburgiana* on, in Quebec, 349
- Picea mariana*, *Cephalcia fascipennis* on, in Canada, 152; *Choristoneura fumiferana* on, in Quebec, 201
- Picea pungens*, *Cephalcia fascipennis* on, in Canada, 152; *Pissodes schwarzi* and *Pissodes curriei* on, in British Columbia, 423
- Picea sitchensis*, susceptibility of, to attack by *Anobium punctatum* in Britain, 181
- Pieris brassicae*, in Britain, susceptibility of races of, to virus diseases, 48; effect of population density, food, and temperature on infection of, with granulosis, 49; infected by *Aerobacter aerogenes* in laboratory, 108; insecticidal properties of drupes of *Melia azedarach* against, in India, 218; chemostimulation of oviposition by, 289; effect of sinigrin on feeding of, 292; semi-synthetic diet for larvae of, reared in laboratory, 299; bionomics of, on cruciferous crops in India, 318; use of, in biological titration of endotoxin of *Bacillus thuringiensis*, 424; use of, in titration of crystal content of *Bacillus thuringiensis*; effect of *Bacillus thuringiensis* on, 425; role of intestinal microflora of, on development of bacterial infection in, 428; enzymatic hydrolysis of crystals of *Bacillus thuringiensis* in, 428, 429; combined use of parasites and micro-organisms in control of, on cabbage in Soviet Union, 432; effects of rhythms of light and temperature on diapause in, in Soviet Union, 434; effect of microsporidiosis on diapause and survival of, parasitised by *Apanteles glomeratus* in Soviet Union, 436; rearing of, on semi-synthetic diets, 448; granulosis virus of, in relation to natural limitation and biological control in Britain, 506; on cabbage in Soviet Union, 553; glucosides as feeding stimulants for, 599
- Pieris brassicae cheiranthi*, in Canary Is., susceptibility of, to virus, 48
- Pieris napi*, adaptations of seasonal cycles to geographical changes in day-length and temperature in, in Soviet Union, 437
- Pieris rapae*, on cabbage in Wisconsin, varietal susceptibility of cabbage to, 66, 67; on rape in Tasmania, 266; varietal resistance in crucifers to, in Wisconsin, 275; artificial parasitisation by *Lydella grisescens* not successful with, 293; control of, on late cabbage in Canada, 348; tests with sodium arsenate and *Bacillus thuringiensis dendrolinus* against, 429; combined use of parasites and micro-organisms in control of, on cabbage in Soviet Union, 432; adaptations of seasonal cycles to geographical changes in day-length and temperature in, in Soviet Union, 437; *Apanteles rubecula* and other parasites of, on cabbage in British Columbia, 594
- Piesma*, disulfoton not effective against, in Poland, 140
- Piesma capitatum*, in Poland, 512; infected with beet crinkle virus, 657
- Piesma maculatum*, in Poland, 512
- Piesma quadratum*, investigations on relationship between beet crinkle virus and, 59; bionomics of, on beet in Poland, 96; overwintering sites of, in Poland, 512; artificial conversion of, into vectors of beet-crinkle virus, 600; injection tests with beet crinkle virus and, 657
- Pigeons, dimethoate controlling damage by, on brussels sprouts in Britain, 230 (see also *Columba*)
- Pimpla disparis*, parasitising *Aporia crataegi* in China, 439
- Pimpla instigator*, parasitising larvae of *Casama innota* in Libya, 51
- Pimpla turionellae*, effect of parasitism by, on adult emergence of *Galleria mellonella*, 204; parasitising *Hyponomeuta padellus malinellus* in Yugoslavia, 392
- Pimplopterus argyresthiae*, parasites of, parasitising *Argyresthia loricella* in New Brunswick, 502
- Pine (see also *Pinus*)
- Pine, adhesion of virus preparations to foliage of, 56; *Hylobius abietis* on, in Norway and Sweden, 57; Thysanoptera on, in Britain, 79; *Rhyacionia buoliana* on, in Soviet Union, 90; pests of, in Poland, 98; pests of, in Germany, 99; pests of, in Czechoslovakia, 102; *Arhopalus asperatus* on, in California, 116; *Thaumetopoea pityocampa* on, in France, 121; *Thaumetopoea pityocampa* on, in Spain, 126; *Rhyacionia buoliana* and *R. duplana* on, in Spain, 127; treatment of cut logs of, against *Pissodes notatus* in Spain; Lepidoptera on, in Spain; damaged by *Myelophilus piniperda* in Spain; attacked by *Hylurgus ligniperda* in Spain, 128; *Hyela julii* and *Diprion similis* on, in Soviet Union, 140; method for obtaining emerged adults of *Exoteleia pinifoliella* from, 179; *Bupalus piniarius* and its parasites on, in Soviet Union, 189; *Ips* spp. on, in North America, 205; *Tomicobia tibialis* parasitising *Ips confusus* on, in California, 206; attraction of *Ips* spp. to, in Florida, 210; parasites of *Thaumetopoea pityocampa* on, in Portugal, 295; *Rhyacionia zozana* on, in California, 307; *Neodiprion sertifer* on, in Germany, 339; *Diprion pini* on, in Germany, 378; *Myelophilus piniperda* on, in Finland, 383; *Neodiprion sertifer* on, in Finland, 384; egg parasites of *Thaumetopoea pityocampa* on, in Spain, 389; diffusion of methyl bromide into timber of, during fumigation against *Hylotrupes bajulus* in Denmark, 402; toxicity of heartwood extracts to larvae of *Hylotrupes bajulus*, 405; effect of wood components of, on larvae of *Hylotrupes bajulus*, 407; treatment of timber

- of, against termites, **408**; *Pissodes schwarzi* and *Pissodes curriei* on, in British Columbia and Yukon Territory, **423**; *Neodiprion sertifer* on, in Scotland; *Thaumetopoea pityocampa* on, in France, **432**; *Aradus cinnamomeus* on, in Czechoslovakia, **454**; *Camponotus* ants on, in Germany, **456**; preplanting treatment of, with insecticides against *Hylobius abietis*, in Czechoslovakia, **517**; effects of soil fertilisers on, in Germany, **522**; predator of *Dendroctonus frontalis* on, in North Carolina, **542**; pests of, in Florida, **543-545**; *Diprion pini* on, in Germany; *Dendrolimus pini* on, in Austria, **562**; development of *Hylobius abietis* on, in north Europe, **563**; effects of fertilised and unfertilised soil on resistance of, to *Ips curvidens* in Germany; effects of osmotic pressure of sap of, on development of insects, **576**; *Dendrolimus spectabilis* on, in Korea, **635**; *Neodiprion taedae linearis* on, in Arkansas, **643**; *Panolis flammea* on, in Germany, **655**; *Thecodiplosis brachyntera* on, in Germany, **659**
- Pine, Hard (see *Pinus palustris*)
- Pine, Jack (see *Pinus banksiana*)
- Pine, Jeffrey (see *Pinus jeffreyi*)
- Pine, Loblolly (see *Pinus taeda*)
- Pine, Lodgepole (see *Pinus contorta*, *Pinus contorta latifolia*, *Pinus contorta murrayana*)
- Pine, Longleaf (see *Pinus palustris*)
- Pine, Monterey (see *Pinus radiata*)
- Pine, Mountain (see *Pinus mugo uncinata*)
- Pine, Ponderosa (see *Pinus ponderosa*)
- Pine, Red (see *Pinus resinosa*)
- Pine, Scots (see *Pinus sylvestris*)
- Pine, Shortleaf (see *Pinus echinata*)
- Pine, Slash (see *Pinus elliotii*)
- Pine, Sugar (see *Pinus lambertiana*)
- Pine, Virginia (see *Pinus virginiana*)
- Pine, Western White (see *Pinus monticola*)
- Pine, White (see *Pinus strobus*)
- $\beta$ -Pinene, affecting reproductive activity in *Schistocerca gregaria*, **605**
- Pinene, Chlorinated, against *Leptinotarsa decemlineata*, **15**
- Pineus pini*, on pine in Germany, **237**
- Pink Clover (see *Trifolium hybridum*)
- Pinnaspis aspidistrae*, on *Citrus* in Florida, **543-545**; Aphelinid parasites of; new records of, on ornamental plants in Bulgaria, **557**
- Pinnaspis strachani*, on *Citrus* in Florida, **543-545**
- Pinosylvan, not toxic to larvae of *Hylotrupes bajulus*, **405**; not affecting development of *Hylotrupes* larvae, **407**
- Pinosylvanmonomethylether, not toxic to larvae of *Hylotrupes bajulus*, **405**; not affecting development of *Hylotrupes* larvae, **407**
- Pinus*, damaged by *Phoracantha semipunctata* in Tunisia, **245**
- Pinus banksiana*, pests of, in Canada and U.S.A., **19**; *Neodiprion swainei* on, **21**, **24**; *Neodiprion rufifrons* and *Neodiprion dubiosus* on, in Wisconsin, **307**; *Neodiprion swainei* on, in Canada, **432**; *Aradus cinnamomeus* on, in Czechoslovakia, **454**; *Neodiprion rufifrons* on, in Wisconsin, **647**
- Pinus Contorta*, *Evagora milleri* on, in California, **42**; insects infesting in Germany, **237**;
- Pissodes schwarzi* and *Pissodes curriei* on, in British Columbia, **423**
- Pinus contorta latifolia*, distribution of attacks by *Dendroctonus ponderosae* on, in British Columbia, **155**
- Pinus contorta murrayana*, *Choristoneura lambertiana subretiniana* on, in U.S.A., **347**
- Pinus echinata*, *Cinara watsoni* on, in Arkansas, **303**; insects attacking cones of, in Arkansas, **303**; *Cydia toreuta* on, in North and South Carolina and in Tennessee, **596**
- Pinus elliotii*, *Dioryctria* spp. on, in Florida, **62**; attraction of *Ips grandicollis* to, in Florida, **210**; *Xyela* spp. on, in Florida, **308**
- Pinus excelsa*, *Simmondsius pakistanensis* feeding on *Parlatoria oleae* on, in Pakistan, **295**
- Pinus flexilis*, *Ips woodi* on, in U.S.A., **310**
- Pinus halepensis*, attacked by *Spodoptera littoralis* in Spain, **255**
- Pinus jeffreyi*, *Ips carinulatus* on, in Nevada, **303**; detecting mortality of *Melanophila californica* in bark of, in California, **596**
- Pinus lambertiana*, *Ips confusus* on, in California, treatment of logs of, with BHC, **41**; *Melanophila consputa* on, in California, **69**
- Pinus monticola*, *Pissodes schwarzi* and *Pissodes curriei* on, in British Columbia, **423**
- Pinus mugo uncinata*, determination of critical number of *Neodiprion sertifer* on, in Czechoslovakia, **632**
- Pinus nigra*, *Aradus cinnamomeus* on, in Czechoslovakia, **454**
- Pinus palustris*, pests of, in Canada and U.S.A., **20**; *Dioryctria* spp. on, in Florida, **62**; attractiveness of, to *Ips calligraphus* in Florida, **210**; *Xyela* spp. on, in Florida, **308**
- Pinus pinaster*, attacked by *Myelophilus piniperda* in Spain, **128**; susceptibility of, to *Pissodes notatus* in Spain, **128**
- Pinus pinea*, replacement of susceptible species of pine by, against *Pissodes notatus* in Spain, **128**; *Pissodes validirostris* on, in Spain, **388**
- Pinus ponderosa*, *Ips confusus* on, in California, treatment of logs of, with BHC, **41**; correction to paper on numbers of *Dendroctonus brevicornis* on, **155**; *Pityophthorus confertus* on, in California, **303**; *Rhyacionia zozana* on, in California, **307**; *Neodiprion* sp. on, in California, **311**; *Choristoneura lambertiana subretiniana* on, in U.S.A., **347**; effect of, on pheromone production in *Ips confusus*, **409**; attractiveness of, to *Dendroctonus brevicornis* following lightning attack, **541**; *Dendroctonus adjunctus* and associated nematodes on, in New Mexico, **537**; susceptibility of, to *Neodiprion sertifer* in Michigan, **543**
- Pinus radiata*, *Aphrophora* spp. on, in California, **68**; attacked by *Myelophilus piniperda* in Spain, **128**; *Toumeyella pinicola* on, in California, **164**
- Pinus resinosa*, pests of, in Canada, **19**; pests of, in U.S.A., **20**, **36**; toxicity of Panazol AN-5 to, **36**; *Schizolachnus piniradiatae* on, in Ontario, **44**; *Eucosma monitorana* on, in Wisconsin, **46**; *Matsucoccus resinosa* on cut logs of, in United States, **179**; distribution of *Rhyacionia buoliana* and associated insects on, in Maryland, **304**; susceptibility of, to *Neodiprion sertifer* in Michigan, **543**



- Pinus rigida*, relationship of sterols of *Neodiprion pratti* to those of, 620
- Pinus strobus*, pests of, in Canada, 19; pests of, in U.S.A., 19, 29; factors affecting attack by *Pissodes strobi* on, in New York State, 159; leucoanthocyanins of, in relation to attack by *Pissodes strobi*, 452; insecticide treatment of, against *Diprion similis* in Wisconsin, 588
- Pinus sylvestris*, pests of, in Canada, 19; pests of, in U.S.A., 19, 68; *Scythropus mustela* on, in Czechoslovakia, 102; *Diprion pini* on, in France, 106; attacked by *Myelophilus piniperda* in Spain, 128; infested by *Hapleginella laevifrons* in Soviet Union, 193; insects infesting, in Germany, 237; *Bupalus piniarius* on, in Holland, 297; unsuccessful attempts to rear *Cinara watsoni* on, in Arkansas, 303; chemical decomposition of, by termites, 406; *Aradus cinnamomeus* on, in Czechoslovakia, 454; attractant effect of  $\alpha$ -terpineol from, to *Myelophilus piniperda*, 567; *Cydia conicolana* on, in Britain, 651; damage to, by *Myelophilus piniperda* in Czechoslovakia, 656; resistance of treated wood of, to *Reticulitermes lucifugus*, 661
- Pinus taeda*, *Cinara watsoni* on, in Arkansas, insects attacking cones of, in Arkansas; *Pityophthorus annectens* on, in Texas, 303; *Xyela* spp. on, in Florida, 308; *Dendroctonus frontalis* on, in Louisiana, 370; parasitism of *Rhyacionia* spp. on, in Georgia, 590
- Pinus virginiana*, *Neodiprion pratti pratti* on, in Virginia, 34; *Cinara watsoni* on, in Arkansas, 303; relationship of sterols of *Neodiprion pratti* to those of, 620
- Pipal diplois pipal diplois*, bionomics of, on *Ficus religiosa* in India, 84
- Piper* beetle, *Lepidosaphes cornutus* on, in India, 318
- Piper methysticum*, *Aspidiotus destructor* on, in New Hebrides, 223
- Piper nigrum*, *Anonaepestis tamsi* on, in West Africa, 73; *Aspidiotus destructor* on, in New Hebrides, 223
- Piperonyl Butoxide, as synergist with Bidrin, 28; as synergist with pyrethrum, 81, 82, 113, 114; as synergist with carbamates, 186; with pyrethrins in sprays against Lepidopterous larvae, 348; as synergist with carbamates, 420; as synergist with pyrethrins, 442; site of action of, in insects, 462; movement of, into interior of treated bags, 487; with pyrethrum, against *Lasioderma serricorne*, 583; and pyrethrins, against *Lema melanopa*, 641
- Piperonyl Cyclonene, as synergist with Bidrin, 28
- Pissodes affinis*, bionomics and ecology of; on pine in Canada and U.S.A., 20
- Pissodes approximatus*, bionomics and ecology of; on pine and spruce in Canada and U.S.A., measures against, 20
- Pissodes curriei*, distribution and hosts of, in British Columbia and Yukon Territory, 423
- Pissodes notatus*, insecticide control of, on pine in Spain, 128
- Pissodes pini*, responses of, to humidity, 571
- Pissodes schwarzi*, distribution and hosts of in British Columbia and Yukon Territory, 423
- Pissodes sitchensis*, systemic insecticides in sprays against, on *Picea sitchensis* in Washington State, 500
- Pissodes strobi*, factors affecting attack by, on *Pinus strobus* in New York State, 159; leucoanthocyanins of *Pinus strobus* in relation to attack by, 452; technique for sexing adults of, 463
- Pissodes validirostris*, *Hapleginella laevifrons* associated with, on pine in Soviet Union, 193; timing of control measures against, on pine in Spain, 388
- Pistacio (see *Pistacia vera*)
- Pistacia terebinthus*, *Saissetia oleae* on, in Greece, 52
- Pistacia vera*, *Kermania pistaciella* on, in Iran and Turkey, 10
- Pittosporum tobira*, as food-plant of *Toxoptera* in Italy, 103
- Pityophthorus annectens*, effect of insect attractants on, on pine in Texas, 303
- Pityophthorus confertus*, effect of insect attractants on, on pine in California, 303
- Pityophthorus pseudotsugae*, *Scolytus ventralis* not developing on *Abies concolor* infested by, in California, 170
- Pityophthorus pulicarius*, attacking cones of *Pinus taeda* and *P. echinata* in Arkansas, 303
- Plagiotrochus suberi*, bionomics and control of, on cork oak in California, 494
- Plane (see *Platanus*)
- Planococcoides njalensis*, transmission of swollen-shoot virus by, on cacao in Nigeria, 625
- Planococcus*, *Clausenia josefi* reared from, on grape vine in Israel, 257
- Planococcus citri*, parasite of, 132; O,O-diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate against, on *Coleus*, 160; method for rearing, on defined diet, 370; *Cryptolaemus montrouzieri* for control of, on *Citrus* in Sicily, 607; *Cryptoblabes gnidiella* associated with, on *Citrus* in Sicily, 608; *Cadra cautella* associated with, on *Citrus* in Sicily, 609
- Planococcus kenyae*, control of, by *Anagyrus kivuensis* in Kenya, 242
- Planococcus lilacinus*, control of, damaging coffee in India, 614
- Plantago*, apple aphids migrating to, 121
- Plantago lanceolata*, aphids on, in Britain, 384; *Melolontha melolontha* reared on leaves and stems of, in France, 460
- Plantago major*, flea-beetles feeding on, 12; aphids on, in Britain, 384
- Plantain (see *Plantago*)
- Platanoxus westwoodii*, parasitic in larvae of *Lasioderma serricorne* in India, 399
- Plastics, termites attacking, 240
- Platanus*, termites on, in Italy, 329
- Platanus racemosa*, *Stomacoccus platani* on, in California, 486
- Plathypena scabra*, toxicity of O,O-diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate to, 160
- Platygaster*, parasitising *Mycodiplosis alternata* in Connecticut, 69
- Platygaster taras*, parasitising *Haplodiplosis equestris* in Germany, 100

- Platyeris rhadamanthus*, possible release of, against *Oryctes rhinoceros* in Malaya, 178; against *Oryctes rhinoceros* in India, 313
- Platynota stultana*, egg mortality from  $\gamma$ -irradiation of adults of, 170
- Platypus cylindrus*, attacking deciduous shade trees in Spain, 255
- Platypus latreillei*, associated with cacao in Costa Rica, 375
- Platypus oxyurus*, attacking *Abies alba* in Spain, 255
- Platypus rugulosus*, associated with cacao in Costa Rica, 375
- Platypus wilsoni*, fungus repositories in, on Douglas fir in British Columbia, 310
- Plistophora melolonthae*, transferred to *Nosema*, infecting larvae of *Melolontha melolontha* in France, 427
- Plodia interpunctella*, diet for, 30; effect of amplified sound on reproduction by, 34; in stored sorghum in South Africa, insecticides against, 82; infesting stored dates in Israel, 143; effect of  $\gamma$ -radiation on, 252; attacking acorns and seeds of *Pinus halepensis* in Spain, 255; susceptibility of, to *Bacillus thuringiensis*, 430; high frequency electrical fields for control of, in stored wheat, 490; effects of  $\gamma$ -radiation on, 495; rice-bran extracts terminating diapause in, in Japan, 548
- Plum, *Lymantria dispar* on, in Yugoslavia, 7; *Hoplocampa* spp. on, in Poland, 9; *Eriophyes padi* on, in England, 49; aphids on, in Poland, 96; *Panonychus ulmi* and predacious mites on, in Germany, 121, 122; *Conotrachelus nenuphar* on, in Ohio, 165; *Typhlocyba rosae* on, in Bulgaria, 197; *Prospaltella perniciosi* parasitising *Quadraspidiotus perniciosus* on, in France, 225; *Pannonychus ulmi* on, in Bulgaria, 325; *Ischnonyx prunorum* on, in Bulgaria, 327; *Parlatoria oleae* and *Quadraspidiotus perniciosus* on, in Italy, 328; *Hyalopterus pruni* on, in Czechoslovakia, 391; *Cydia funebrana* on, in Poland, 452; pests of, in Poland, 453; *Trichogramma cacoeciae* parasitising *Cydia funebrana* on, in Poland, 454; insecticide residues on, 461; *Trichogramma cacoeciae* parasitising *Cydia funebrana* on, in Poland, 559; *Hyponomeuta* spp. on, in Switzerland, 561; *Lithocolletis corylifoliella* on, in Holland, 568
- Plum, Hog (see *Spondias mombin*)
- Plum, Japanese (see *Prunus salicina*)
- Plusia californica*, effects of female sex pheromones on, 61
- Plusia signata*, attacking groundnut in India, 216
- Plutella maculipennis*, varietal susceptibility of cabbage to, in Wisconsin, 66, 67; dimethoate against, on brussels sprouts in Britain, 230; sprays against, on cauliflower in Britain; heavy rain not affecting numbers of, 231; on rape in Tasmania, 266; varietal resistance to, in crucifers in Wisconsin, 275; chemo-stimulation of oviposition by, 289; *Nythobia* sp., reared from, in Chile, 377
- Plyac (see Polyethylene)
- Phigalio*, *Dicranoctetes saccharella* parasitised by, in Peru, 194
- Phigalio attis*, parasitising larvae of *Heterarthrus ochropodus* in Italy, 331
- Phigalio mediterraneus*, parasitising *Dacus oleae*, 107
- Poa compressa*, *Thymelicus lineola* not found on, in Ontario, 350
- Poa pratensis*, damaged by *Pediasia* spp. in Kentucky, 269
- Podagrica*, control of, on cotton in Sudan, 656
- Podagrica pallida*, on cotton in Sudan, 656
- Podagrica puncticollis*, on cotton in Sudan, 656
- Podisus maculiventris*, laboratory rearing of, in Quebec, 349
- Podocarpus*, *Paracalacarus podocarpi* on, in Florida, 543-545
- Podosphaera leucotricha*, sprays against, not affecting *Typhlodromus pyri* on apple in Holland; effect of fungicides against, on beneficial mites and insects on fruit in Holland 122; fungicides against, suppressing *Panonychus ulmi* on apple, 498; combined control of spider mites and, 652
- Poecilomyces farinosus*, attacking *Coleophora laricella*, 525
- Poekilocerus pictus*, effect of insecticides on blood cells of, 662
- Pogonomymex*, keys to subgenera, complexes and species of, in North America, 571
- Pogonomymex occidentalis*, individual mound treatments for control of, in Wyoming, 486
- Poland, pests of, on *Ribes* in, *Lymantria dispar* on apple in, *Hoplocampa* sp. on plum in, 9; fauna overwintering in bark of apple in, 95; *Hylotrupes bajulus* on timber in, 95; natural enemies of pests in, aphids on fruit trees and bushes in; Phytoseiids in orchards in; *Trichogramma cacoeciae* parasitising eggs of *Panolis flammea* in; *Aphis fabae* on *Euonymus europaeus* in, pests of beet in, 96; *Hyponomeuta padellus malinellus* on apple in, 97; pests of pine in; *Aphis fabae* on *Euonymus europaeus* in, 98; *Rhagoletis cerasi* on cherry in, 137; *Acanthoscelides obtectus* infesting stored and field beans in, *Macrosiphum pisum* and *Therioaphis maculata* on lucerne in; aphids on crucifers in; aphids on apple in, 139; *Aphis fabae* on beet in, 140; Anobiids in forests in, 324; *Leptinotarsa decemlineata* in, 340; *Nosema* sp. infecting larvae of *Euproctis chrysorrhoea* in, 427; entomophthoraceous fungi in insects in, 428; control of *Cydia funebrana* on plum in, 452, 453; control of *Bryobia praetiosa* on apple in; *Steneotarsonemus fragariae* and *Tetranychus telarius* on strawberries in; pests of apple and plum in, 453; control of *Cydia funebrana* on plum in, 454; varietal resistance of lupins to *Macrosiphum pisum* in, 511; overwintering sites of *Piesma quadratum* in *Piesma* spp., in; *Thomasiana ribis* on black currant in; control of *Contarinia medicaginis* on lucerne in 512; disulfoton granules controlling *Aphis fabae* on beet in; control of stored-product beetles in, 513; aerosols against *Leptinotarsa decemlineata* in; control of *Rhagoletis cerasi* on cherry in, 514; control of *Dasyneura pyri* on pear in; resistance to insecticides in *Tetranychus telarius* in; resistance to insecticides in *Dasyneura pyri* on pear in, 515;



- temperature and spread of aphid-borne potato viruses in, 534; *Trichogramma cacoeciae* parasitising *Cydia funebrana* on plum in, 559; *Trichogramma* spp. in; insects found in abandoned feeding sites of Tortricids in; zoophagism of terrestrial Hemiptera-Heteroptera in, 603; mite fauna of plants in, 633
- Polistes*, preying on Lepidopterous pests of rice in British Guiana, 172
- Polistes versicolor*, preying on *Mocis repanda* in Venezuela, 212
- Pollen, in diet for adults of *Diabrotica undecimpunctata undecimpunctata*, 285; effect of, on predation by *Amblyseius hibisci*, 306; in diet for *Coccinella septempunctata* reared on, 595
- Pollination, and bees, 38, 45; use of *Bombus* spp. for, of *Trifolium pratense* and lucerne, 184; of plants, 196; by honey bees, 296; ecological aspects of, 525
- Polyamide Fabric, not damaged by *Acheta domesticus* and *periplaneta americana*, 125
- Polybia*, preying on Lepidopterous pests of rice in British Guiana, 172
- Polyblastus flavicauda*, parasitising *Pristiphora abietina* on spruce in Germany, 566
- Polybutene, in sprays against *Tetranychus telarius*, 230
- Polychlorobutadiene, as soil fumigant against *Phylloxera vitifoliae*, 634
- Polychlorocamphene, in sprays against *Sitona* spp., 550
- Polychloroprene, effect of, on *Cleonus punctiventris*, 195
- Polycyrtidea flavopicta*, *Rupela albinella* parasitised by, in British Guiana, 172
- Polyester Fabric, not damaged by *Acheta domesticus* and *Periplaneta americana*, 125
- Polyethylene, use of, as spreader with carbaryl, 590
- Polychodes stipella*, taken at light in forests in Spain, 255
- Polyporus abietinus*, causing deterioration of dead balsam fir in Canada, 309
- Polystyrene, damaged by *Hofmannophila pseudospretella*, 289; bait-traps of, for *Dacus oleae*, 578
- Polytela gloriosae*, bionomics of, infesting lilies in India, 258
- Polythene, damage to, by aquatic moths, 289
- Polyvinyl-chloride Strips, slow release of vapour from, impregnated with dichlorvos, 505
- Pomegranate, *Ectomyelois ceratoniae* on, in Saudi Arabia, 211; Tetranychid mites on, in Iran, 519
- Ponderosa Pine (see *Pinus ponderosa*)
- Pontederia cordata*, dieldrin residues in, 586
- Popillia japonica*, control of, on soy beans in Illinois, 281; tepa, apholate, and metepa as sterilants for, in New Jersey, 364; *Tiphia vernalis* parasitic in, in New Jersey and Pennsylvania, 369; milky disease of, in Connecticut, 427; repopulation of thrips in areas previously treated with insecticides against, in Illinois, 497
- Poplar (see also *Populus*)
- Poplar, pests of, in Czechoslovakia, 8; *Cryptorhynchus lapathi* on, in Italy, 94; *Paranthrene tabaniformis* on, in Spain, 127; *Paranthrene tabaniformis* and other Lepidoptera on, in Spain, 128; damaged by *Phytobia* sp. in Holland, 178; insect pests of, in Soviet Union, 193; *Lepidosaphes ulmi* on, in Spain, 256; *Heterarthrus ochropodus* on, in Italy, 331; *Stilpnotia salicis* in windbreaks of, in Austria, 521; *Melasoma* spp. on, in Florida, 543-545
- Poplar, Black (see *Populus nigra*)
- Poppy, damaged by *Tanymericus indicus* in India, 214
- Population Studies, sampling methods for, 19; of insects, 52
- Populus* (see also Poplar)
- Populus*, *Chaitophorus populellus* on, in Wyoming, 26; translocation of oxydemeton-methyl in, 27; chemical decomposition of, by termites, 406
- Populus nigra*, *Stilpnotia salicis* on, in Czechoslovakia, 8; effect of leaf-miners on photosynthesis and transpiration of, *Phyllocnistis suffusella* and *Phytomyza populi* on, in Germany, 59; *Telenomus harpyae* parasitising *Dicranura vinula* on, in Portugal, 295
- Populus tremuloides*, *Malacosoma dissitia* on, in Minnesota, 43; *Chrysomela crotchii* on, in Ontario, 311; *Pseudexentera oregonana* on, in Canada, 402
- Porcellio scaber*, chemical control of, invading houses in Germany, 564
- Porphyrimia parva*, attacking *Ziziphus jujuba* in China, 238
- Porphyryns, Reduced, conversion of DDT to DDD by, 374
- Porphyrosela minuta*, natural enemies of, on clover in Chile, 377
- Portugal (see also Azores)
- Portugal, parasites attacking forest pests in, 294; *Anarsia lineatella* in, 333; *Prays oleae* on olive in; mites on *Citrus* in, 386; pests of granaries in; pests of granaries overwintering in nearby trees in; *Anarsia lineatella* and other Microlepidoptera attacking peach in; *Carpoglyphus lactis* on dried figs in, 387; distribution and food-plants of *Quadraspidiotus perniciosus* in, 403; mites on cultivated plants in; *Psilosage discedens* parasitising *Periclista andrei* in; *Periclista* spp. on *Quercus* spp., in, 460; *Prays citri* on lemon in, 461
- Potassium, effect of, in groundnut plants on fecundity of *Aphis craccivora*, 317; (as plant nutrient), effects of, on *Tetranychus telarius*, 484; (as plant nutrient), effects of, on reproductive rates of aphids, 506
- Potassium Dichromate, in traps for aphids, 589
- Potassium Hydroxide, in diets for insects, 30, 34
- Potato, pests of in Soviet Union, 14, 16; *Leptinotarsa decemlineata* on, in France, 52; *Leptinotarsa decemlineata* on, in Rumania, 91; *Leptinotarsa decemlineata* on, in Soviet Union, 89; *Melolontha melolontha* on, in China, 89; in relation to infestation of wheat by *Hylemya coarctata*, 105; *Gryllotalpa gryllotalpa* reared on, 124; aphids and spread of leaf roll virus of, in South Africa, 130; *Phthorimaea operculella* on, in Malta, 135; *Muscina stabulans* parasitising *Leptinotarsa decemlineata* on, in Soviet Union, 142;

- Myzus persicae* and *Aphis gossypii* on, in India, 146; *Nezara viridula* on, in Japan, 151; damage to, by wireworms in Quebec, 157; *Thrips tabaci* and *Tetranychus telarius* on, in Washington State, 167; *Leptinotarsa decemlineata* on, in Bulgaria, 196; stolon virus disease of, in Bulgaria, 198; *Heteronychus arator* on, in Western Australia, 222; effects of soil applications of DDT and aldrin on, 231; dimethyl 1-dimethylcarbamoyl-1-propen-2-yl phosphate residues in, 240; *Paratrioza cockerelli* and *Myzus persicae* on, in Arizona, 268; *Anuraphis helichrysi* transmitting tobacco vein necrosis virus of, in Northern Ireland, 336; transmission of virus of, by *Myzus persicae*, 338; *Phthorimaea operculella* on, in Israel, 339; insect pests on, in U.S.A., 343; *Limoniuss canus* on, in Washington, 366; pests of, in Britain, 386; *Leptinotarsa decemlineata* on, in Italy, 390; *Phthorimaea operculella* on, in Queensland, 449; *Leptinotarsa decemlineata* on, in France, 459; *Melolontha melolontha* reared on leaves and stems of, in France, 460; *Leptinotarsa decemlineata* on, in Rumania, 461; *Conoderus falli* on, in U.S.A., 463; treatment of, with insecticides against aphids and virus diseases in Britain, 469; *Leptinotarsa decemlineata* on, in Poland, 514; effect of temperature on spread of aphid-borne virus diseases of, in Poland, 534; *Leptinotarsa decemlineata* on, in Bulgaria, 555; survival of *Perilloloides bioculatus* feeding on; *Leptinotarsa decemlineata* on, 575; incidence of *Alternaria solani* on, treated against aphids; effect of disulfoton granules on yield of, in Switzerland, 577; *Euzophera osseatella* on, in Israel, Egypt, and other Mediterranean countries, 611; *Phthorimaea operculella* on, in Israel, 613; *Phyrdenus muriceus* on, in Brazil, 639
- Potato Starch, effect of, on pheromone production in *Ips confusus*, 409
- Potato (Stored), disinfection of Storage sites for, against *Phthorimaea operculella* in Malta, 135; fumigation of, against *Phthorimaea operculella* in China, 264; protection of, from *Phthorimaea operculella* in India, 664
- Potato, Sweet (see Sweet Potatoes)
- Potosia cuprea*, laboratory rearing of *Microphthalma europaea* on, 105
- Potosia opaca*, rearing of *Microphthalma europaea* on, 105
- Praon*, parasitic in *Macrosiphum pisum* in Ontario, 351
- Praon pequodorum*, parasitic in *Macrosiphum pisum* in Ontario, 351
- Praon volucre*, parasitising *Hyalopterus amygdali* in Italy, 103; ineffective against *Hyalopterus pruni* in Czechoslovakia, 391
- Prays citri*, first record of, on lemon in Portugal, 461; attacked by *Gymnoscelis pumilata* in Sicily, 608
- Prays oleae*, distribution of larvae of, on olive trees in Portugal, 386
- Preparation P-2, effects of, on mechanism of action of organo-phosphorus compounds on insects, 13
- Pressure, Atmospheric (see Atmospheric Pressure)
- Pressure, Osmotic (see Osmotic Pressure)
- Prince Edward Island, *Hylemya brassicae*, on 352
- Prionoryctes caniculus*, distribution, bionomics and control of, on yams in Nigeria, 570
- Prionoryctes rufopiceus*, distribution, bionomics and control of, on yams in Nigeria, 570
- Pristhesancus papuensis*, predacious on *Musgraveia sulciventris* in New South Wales and Queensland, 314
- Pristiphora abietina*, parasites of, on spruce in Germany, 566; effect of osmotic pressure of tree sap on development of, in Germany, 576
- Pristiphora aquilegiae*, on columbine in Ontario, 179
- Pristiphora erichsonii*, use of, in tests on labile exotoxin produced by *Bacillus thuringiensis*, 429; predation of, by *Sorex cinereus* in Newfoundland, 501; toxicity of DDT to, affected by larval size and weight, 522; occurrence and parasites of, on larch in Japan, 660
- Procambarus clarkii*, reared in rice fields in Louisiana, toxicity of pesticides to, 37; not affected by insecticides applied to irrigated rice in Louisiana, 282
- Proceras indicus*, on mature sugar-cane in India, 479
- Proceras sacchariphagus*, release of *Diatraeaophaga striatalis* for control of, on sugar-cane in Reunion and Madagascar, 557; *Trichogramma australicum* parasitic in eggs of, in Madagascar, 558; *Trichogramma* spp. released against, on sugar-cane in Madagascar, 630
- Proceras venosatus*, granules against, on maize in China, 221
- Prochilonurus*, species of parasitising *Nipaeococcus vastator* in India, 86
- Procystiphora indica* sp.n., infesting mango inflorescences in India, 477
- Procystiphora mangiferae*, bionomics of, infesting mango inflorescences in India, 477
- Prolan, mixture of Bulan and (see Dilan)
- Prolasioptera berlesiana*, reared on fungi; relation between *Macrophoma* spot on olive and, in Israel, 637
- Proline, in diet for *Tribolium* spp., 503
- L-proline, attractive to *Eurytoma roddi*, 57; and sucrose, inducing feeding response in *Choristoneura fumiferana* on *Picea glauca*, 158
- Propanol, *Drosophila melanogaster* responding to, 289
- M-Propargyl Compound, against larvae of *Culex pipiens fatigans*, 373
- P-Propargylthiophenyl Methylcarbamate, against *Musca domestica*, 373
- Propiophenone, not improving residual action of pyrethrins, 225
- n-Propyl 2,2-Dichlorovinyl Phenylphosphonate, toxicity of, to agricultural insects, 283
- M-Propyl Methylcarbamate, against larvae of *Culex pipiens fatigans*, 373
- Propylea quatuordecimpunctata*, natural enemies of, 104; toxicity of insecticide sprays to, in Britain, 471; host-specificity and micro-



- distribution of, attacking aphids in France, 559
- 2-Propyn-1-ol, (as fumigant) against pests of stored products, 488
- Prorops nasuta*, control of *Hypothenemus hampei* by, in Brazil, 242
- Prosectogaster*, parasitising *Dasyneura brassicae* on rape in Sweden, 182
- Proserine, effects of, on mechanism of action of organophosphorus compounds on insects, 13
- Prosoeuzophera impletella*, differences between *Euzophera magnolialis* sp.n. and, 210
- Prosopocera*, attacking *Isoberlinia scheffleri* in Tanganyika, 444
- Prospaltella fasciata*, parasitising *Quadraspidiotus perniciosus* in Germany, 102
- Prospaltella opulenta*, released against *Aleurocanthus woglumi* on *Citrus* in Barbados, 172
- Prospaltella perniciosi*, parasitising *Quadraspidiotus perniciosus* in Soviet Union, development of males of, 12; parasitising *Quadraspidiotus perniciosus*, in Germany, 102; released for control of *Quadraspidiotus perniciosus* on apple and peach in France, spray chemicals against *Quadraspidiotus perniciosus* not harmful to, 123; use of, against *Quadraspidiotus perniciosus* on fruit trees in France, 225; rearing and establishment of, against *Quadraspidiotus perniciosus* in Austria, 294; method for large scale breeding of, for control of *Quadraspidiotus perniciosus* in Soviet Union, 322; effectiveness of, against *Quadraspidiotus perniciosus* on fruit trees in Switzerland, 628
- Protaetia aurichalcea*, feeding on pollen stores of *Apis indica* in India, 534
- Protein, analytical method for insecticides in, 464
- Protein Hydrolysate, in baits for *Rhagoletis pomonella*, 352; in diet for *Coccinella septempunctata*, 595; in baits for *Dacus oleae*, 638
- Prothidathion, chemical definition of, 2
- Prothoate, survey of data on, 81; and chlorfenson in sprays against mites and aphids, 123
- Protocatechualdehyde, effects of, on termites, 406
- Protocatechuic Acid, effects of, on termites, 406
- Protolachnus agilis*, damaging pine in Germany, 237
- Protomicroplitis*, reclassification of, 55
- Protoparce*, *Sphinx sexta* type species of, and synonym of *Manduca*, 545 (see *Manduca*)
- Protozoa, control of insects by, 240; infection of insects by, 427
- Provender Mill, control of *Ephestia kuehniella* in, 505
- Prunus*, parasites of aphids associated with, in Czechoslovakia, 178
- Prunus avium*, relation of, to effectiveness of primary parasites of *Rhyacionia buoliana*, 90
- Prunus mahaleb*, transmission of virus of, by aphids, 26; aphids on, in Bulgaria, 327
- Prunus padus*, flea-beetles on, in Soviet Union, 12
- Prunus salicina*, *Eulecanium* spp. on, in Ontario, 204
- Prunus serotina*, *Lithocolletis propinquella* on, in Canada and U.S.A., 21
- Prunus spinosa*, *Hyponomeuta padellus* on, in Germany, 54; *Ischnonyx prunorum* on, in Bulgaria, 327; *Hyponomeuta padellus* on, in Germany, 337
- Prunus virginiana*, *Rhopalosiphum padi* on, in Manitoba, 311; *Archips cerasivoranus* on, in Minnesota, 642
- Pruthiana sexnotata*, on sugar-cane in India, 300
- Psallus ambiguus*, toxicity of insecticide sprays to, in Britain, 471
- Psallus perrisi*, preying on *Archips crataeganus* on oak in Czechoslovakia, 199
- Psallus seriatus*, insecticides against, on cotton in Texas, 278, 358; resistance of experimental cotton strain 1514 to, in Texas and Mississippi, 362; systemic insecticides against, on cotton in Texas, 589; sprays against, on cotton in Texas, 591
- Psammettix alienus*, virus of winter wheat transmitted by, in Soviet Union, 294
- Psara bipunctalis*, *P. ipomoealis* differentiated from, 209
- Psara ipomoealis*, on sweet potato in southern United States, 209
- Pseudacanthotermes*, distribution of, in Nigeria, 467
- Pseudacanthotermes militaris*, attacking *Eucalyptus* in Uganda, 443
- Pseudaletia separata*, on wheat in India, 86; artificial diet for, 87; factors affecting hatching and development of, in China, 88; metabolism of blood sugars of, 238; identification of, in India, 318; nuclear polyhedrosis of, in China, 439
- Pseudaletia unipuncta*, rearing of, 104; incidence of microsporidiosis in, in Hawaii, 175; parasitism of, in Hawaii, 175; dusts against, on sorghum in India, 260; artificial parasitisation by *Lydella grisescens* not successful with; frass of, attracting females of *Lydella grisescens*, 293; identified as *Pseudaletia separata* in India, 318; outbreaks of, on cereal crops in Ontario, natural enemies of, insecticides against, 350; phagocytosis of *Bacillus thuringiensis* in larvae of, in Oregon, 372; cytoplasmic-polyhedrosis virus in, in Hawaii, 373; occurrence of, in Soviet Union, 553; occurrence and distribution of, in Israel, 612
- Pseudanastatus albitarsis*, parasitising *Dendrolimus spectabilis* in Korea, 635
- Pseudaonidia duplex*, in Florida, 543-545
- Pseudaulacaspis pentagona*, *Aphytis africanus* reared from, on mulberry in South Africa, 130; winter control of, on peach in Italy, 390
- Pseudexentera improbana*, detrimental effect of, on *Monochaeta albicans* in Nova Scotia, 346
- Pseudexentera oregonana*, on *Populus tremuloides* in Canada, 402
- Pseudhomalopoda prima*, parasitism by, of Coccids on *Citrus* in Florida, 207
- Pseudococcus citriculus*, parasitic control of, by *Clausenia purpurea* on *Citrus* in Israel, 258

- Pseudococcus comstocki*, effects of organophosphorus insecticides against, on mulberry in Soviet Union, 320
- Pseudococcus maritimus*, on *Citrus* in Iran, 519
- Pseudomonas*, affecting laboratory populations of *Anthonomus grandis*, 579
- Pseudomonas aeruginosa*, against *Stilpnotia salicis*, 8; pathogenicity of, for *Galleria mellonella*, 427
- Pseudomonas chlororaphis*, infecting *Archips crataeganus* in Czechoslovakia, 199
- Pseudomonas fluorescens*, against *Stilpnotia salicis*, 8
- Pseudophonus*, on cereals in Soviet Union, 17
- Pseudopityophthorus pruinus*, on oak in W. Virginia, 33
- Pseudoplusia includens*, on field crops in Alabama, 498
- Pseudoscyrmus*, not successful against *Aspidiotus destructor* in New Hebrides, 224
- Pseudotsuga menziesii*, *Trypodendron lineatum* on, in British Columbia, 22; systemic activity of insecticides in, toxicity of insecticides to, pests of, in Washington, 44; *Cinara* reducing growth of seedlings of, in Washington State, 152; Diptera associated with *Dendroctonus pseudotsugae* on, in Washington and Oregon; *Platypus wilsoni* on, in British Columbia, 310; effectiveness of, in rearing medium for *Medetera aldrichii*, 412; *Contarinia* spp. and *Oligonychus ununguis* on, in British Columbia, 421; *Choristoneura fumiferana* on, in New Mexico, 498; *Coleophora laricella* on, in Sweden, 525; *Trypodendron lineatum* on, in Oregon, 656; resistance of treated wood of, to *Reticulitermes lucifugus*, 661
- Psidium guayana*, *Anastrepha suspensa* on, in Florida, 543-545
- Psila rosae*, mass rearing of, 53; insecticides against, on carrots in Britain, 80; seed treatments against, 137; rearing of, 154; DDT and aldrin against, in Britain, 232; use of scents to attract, in Britain, 399; tests of insecticides against resistant strains of, on carrots in British Columbia, 421; insecticide control of, on celery on Britain, 469; integrated control methods for, in Britain, 507
- Psilosage discedens*, parasitising *Periclista andrei* on oak in Portugal, 295; *Periclista andrei* parasitised by, in Portugal, 460
- Psylla*, status of, 55
- Psylla mali*, on apple in Poland, 453
- Psylla pyri*, control of, on pear in Italy, 651
- Psylla pyricola*, natural enemies of, 38; on pear in California, 38, 55; azinphos-methyl against, 39; transmission of viruses by, 55; effect of stock on susceptibility of pear to feeding by, control of, on pear in Washington, 282; review of, in Ontario, 402; transfer of radioactive components by, to pear seedlings, 621; evaluation of insecticides for control of, on pear in Washington State, 643
- Psylla uncatoides*, occurrence and control of, on *Acacia* and *Albizia* in California, 180
- Psyllaephagus*, parasitising *Psylla pyricola* in California, 38
- Psylliodes chrysocephalus*, voltinism and its determination in, on crucifers, 239; seed dressings in control of, on rape in Germany, 339
- Psyllobora picta*, destroying other insects in Chile, 47
- Pteromalus*, parasitising *Aporia crataegi* in China, 439
- Pteromalus puparum*, parasitising *Pieris rapae* in British Columbia, 594
- Pteroptrix*, biological aspects of species of, 304
- Pteroptrix albocincta* sp.n., from *Aonidiella citrina* in Hong Kong and Formosa, 304
- Ptilinus fuscus*, attacking deciduous trees in Poland, 324
- Ptilinus pectinicornis*, attacking deciduous trees in Poland, 324
- Ptinus tectus*, factors affecting longevity and oviposition in, in stored wheat, *Sitophilus* in relation to, 76; bird nests as sources of infestations of, in flour in Britain; distribution of, in stacks of bagged flour, 601; insecticides against, 622
- Puerto Rico, rearing *Diatraea saccharalis* in, 268
- Pulses, pests of, in India, 316
- Pulses (Stored), treatment of, damaged by insects and mites in Turkey, 614
- Pulvinaria*, distinguishing characters of, 460
- Pulvinaria mesembryanthemi*, preyed on by *Coccophagus caridei* in Chile, 377
- Pulvinaria saccharia* sp.n., attacking sugar-cane in South Africa, 403
- Pumpkin, as rearing medium for *Dacus* spp., 218; aphids in relation to virus disease of, *Aphis gossypii* on, in France, 457
- Pungenin, deterring feeding by *Choristoneura fumiferana*, 158
- Puntius javanicus*, toxicity of  $\gamma$  BHC to, 494
- Pyemotes ventricosus*, attacking *Scolytus ventralis* on *Abies concolor* in California, 170; occurrence of, in silk cocoons in India, 261
- Pyracantha coccinea*, *Eulecanium persicae* on, in Ontario, 203
- Pyrethrins, susceptibility of *Dermestes* to, 78; effect of temperature on susceptibility of *Trogoderma granarium* to, 218; toxicity of, to *Sitophilus oryzae*, 261; toxicity of, to adults of *Dacus cucurbitae*, 316; toxicity of, to *Aonidiella aurantii*, 317, with piperonyl butoxide, in sprays, against Lepidopterous larvae, 348; in dusts against pests of stored maize, 394; isoparaffinic solvents as bases for; determination of, by chromatography of dinitrophenyl-hydrazones, 404; with piperonyl butoxide, in dusts against *Sitotroga cerealella* in maize stored in cribs, 442; persistence of deposits of, used in sprays against stored-product beetles, 622; and piperonyl butoxide, against *Lema melanopa*, 641
- Pyrethrum, question of toxicity of, to mushrooms, phytotoxicity of formulations of, against Diptera; against aphids, 81; germination of sorghum enhanced by, uses of, against pests of stored sorghum; use of, to protect dried fish from beetle infestation, residues of, in dried fish, bioassay of, 82; toxicity of, to *Coccinella septempunctata*, 85; toxicity of isomerised extract of, to insects, 112; bioassay of, toxicity of compounds of, to insects, 113; tests for synergists with, 114;



- processes for preparing refined extract of, **116**; in sprays against *Rhopalosiphum erysimi*, **146**; with other synergists, with piperonyl butoxide, toxicity of, to grain beetles, **225**; identification of constituents of, separated by chromatography; use of, against plant pests in Finland, **404**; and piperonyl butoxide, against *Lasioderma serricorne*, **583**; synergistic effect of sulfoxide on, and toxicity of, to *Dysdercus cingulatus*, **662**
- Pyrethrum* Marc, as carrier for pyrethrin dusts, **394, 442**
- Pyridoxine, repellent to *Eurytoma roddi*, **57**
- Pyrilla perpusilla*, aerosols controlling, on sugar-cane in India, **478**; review of knowledge of, on sugar-cane in India, **479**
- Pyrocolloid (see *Pyrethrum*)
- Pyroderces amydraula*, on date in Iran, **519**
- Pyroderces rileyi*, renamed *Sathrobrotia rileyi*, **545**
- Pyrus* (*Malus*), *Rhopalosiphum fitchii* on, in Manitoba, **311**
- Pyrus ussuriensis*, susceptibility to *Psylla pyricola* and decline disease of pear on stocks of, **283**
- ## Q
- Quadraspidiotus perniciosus*, parasite of, in Soviet Union, **12**; natural enemies of, in Germany, **102**; integrated control of, on apple and peach in France, *Prospaltella perniciosi* released against, **123**; use of *Prospaltella perniciosi* against, on fruit trees in France, **225**; rearing and establishment of *Prospaltella perniciosi* against, in Austria, **294**; rearing of, on squash in Soviet Union, for control by *Prospaltella perniciosi*, **322**; control of, on plums in Italy, **328**; control of, with sprays of oil emulsions in India, **343**; winter control of, on apple and peach in Italy, **390**; distribution and food-plants of, in Portugal, **403**; bionomics of, on apple in Moldavia, **508**; control of, on fruit trees in Germany, **519**; effectiveness of *Prospaltella perniciosi* against, on fruit trees in Switzerland, **628**
- Quassia*, in sprays, ineffective against *Chrysomela americana*, **331**
- Quebec, *Neodiprion swainei* on *Pinus banksiana*, in, **19, 21, 24**; virus diseases of insects in, *Neodiprion swainei* in, *Trichiocampus irregularis* and *T. viminalis* in, *Aletia oxygala luteopallens* on chicory in, **50**; parasitism of *Choristoneura fumiferana* on *Abies balsamea* in; *Cephalcia fascipennis* on spruce in, **152**; *Panonychus ulmi* on apple in; *Mermis subnigrescens* parasitising grasshoppers in; wireworms damaging potato in, **157**; sampling populations of *Lepidosaphes ulmi* on apple in, **179**; damage by *Choristoneura fumiferana* to immature balsam fir in, **201**; *Hypoaspis aculeifer* in, **308**; *Exoteleia pinifoliella* on pine in; lucerne resistant to *Macrosiphum pisum* in, **347**; *Enarmonia ratzeburgiana* on *Picea glauca* in; laboratory rearing of *Podisus maculiventris* in, **349**; *Xyloterinus politus* associated with Dutch elm disease in; *Adelges piceae* infesting balsam fir in, **502**
- Queensland, *Sitophilus* spp. in, **4**; virosis-like proliferation of lucerne caused by *Aceria medicaginis* in, **223**; *Eurytoma fellis* and *Musgraveia sulciventris* on *Citrus* in, **314**; *Agonoxena phoenicia* sp.n. on *Archontophoenix alexandrae* in, **445**; control of *Cydia pomonella* on apple in, **448**; insecticide resistance in *Phthorimaea operculella* on potato and tobacco in; *Petrobia latens* and its control on wheat in, **449**; anti-Coccid sprays for use on papaya in; *Earias huegeli* on *Hibiscus trionum* and cotton in; *Earias vittella* on cotton in, **450**; *Oncopera* spp. damaging pasture in, **484**
- Quercetin, effect of, on *Heliothis* spp., **280**; as feeding stimulant for *Anthonomus grandis*, **281**
- Quercus*, *Periclista* spp. on, in Portugal, **460**
- Quercus alba*, *Lymantria dispar* on, in New York State, **356**
- Quercus borealis*, *Lymantria dispar* on, in New York State, **356**
- Quercus cerris*, infested by *Lyctus linearis* in Hungary, **402**
- Quercus garryana*, *Synergus pacificus* in galls of *Besbicus mirabilis* on, in British Columbia, **179**
- Quercus ilex*, *Lepidoptera* on, in Spain, **255**; *Microsporidia* parasitising *Lymantria dispar* on, in Spain, **256**; parasites of *Malacosoma neustria* on, in Portugal, *Elodia tragica* parasitising *Tortrix viridana* on, in Portugal, **294**; virus diseases of *Lepidopterous* defoliators of, in Spain, **431**; *Nepticula heringella* on, in Sicily, **610**
- Quercus petraea*, *Lymantria dispar* on, in Yugoslavia, **7**
- Quercus robur*, *Lymantria dispar* on, in Yugoslavia, **7**
- Quercus rubra*, *Operophtera brumata* on, in Nova Scotia, **346**; *Xylosandrus germanus* on, in Germany, **563**
- Quercus sessiliflora* (see *Q. petraea*)
- Quercus suber*, trunk treatment of, against *Coraebus undatus* in Spain, **255**; *Nemorilla maculosa* parasitising *Archips xylosteanus* on, in Portugal, parasites of *Periclista andrei* and *P. dusmeti* on, in Portugal, parasites of *Tortrix viridana* on, in Portugal, **295**; *Periclista* spp. on, in Portugal, **460**; *Plagiostrochus suberi* and other pests of, in California, **494**
- Quesada gigas*, insecticides against, on coffee in Brazil, **299**
- Quince, *Cydia pomonella* on, in Iran, **10**; aphids on, in Soviet Union, **508**
- ## R
- Rabbits, fate of inhaled C<sup>14</sup>-DDD in, **187**
- Rachiplusia nu*, *Actinote pellenae pellenae* possibly responsible for damage to sunflower attributed to, in South America, **287**

- Rachiplusia* ou, on field crops in Alabama, 498; nucleopolyhedrosis of, infesting mint in Indiana, 535
- Radar, in desert locust survey and control, 597
- Radio Waves (V.H.F.) against wood-boring insects, 623
- Radioactive Isotopes, use of, against insects infesting stored products, 58; effects of  $\gamma$ -radiation from, on *Dacus dorsalis*, *Ceratitis capitata* and their parasites, 170; quarantine treatments with  $\gamma$ -radiation from, against *Sternonchus mangiferae* in mangos, 173; effects on *Anthrenus flavipes* of  $\gamma$ -radiation from, 235; effects on ovarian tissues of *Ostrinia nubilalis* of  $\gamma$ -radiation from 238; effects of  $\gamma$ -radiation on *Sitophilus* spp., 249-252; use of, for disinfection of grain, 249-253; effect of  $\gamma$ -radiation from, on *Tribolium castaneum*, 251, 252; effect of  $\gamma$ -radiation from, on *Oryzaephilus surinamensis*, *Cadra cautella*, *Lasioderma serricornis*, *Plodia interpunctella* and *Rhizopertha dominica*, 252; effects on *Cydia pomonella* of  $\gamma$ -radiation from, 271; effects of  $\gamma$ -radiation from, on *Dacus oleae*, 284; effects of  $\gamma$ -radiation from, on *Dacus tryoni*, 298; effects on granary insects and mites of  $\gamma$ -radiation from, 324;  $\gamma$ -radiation from, effect of, on wood components, 407; effects of  $\gamma$ -radiation from, on *Anthonomus grandis*, 412; effects of  $\gamma$ -radiation from, on insects, 465; effects of  $\gamma$ -radiation from, on *Plodia interpunctella* and *Sitotroga cerealella*, 495; effects of  $\gamma$ -radiation from, on eggs of *Schistocerca gregaria*, 531; effects of  $\gamma$ -radiation from, on *Dacus tryoni*, 585; effects of  $\gamma$ -radiation from, on *Trogoderma glabrum* and *Attagenus megatoma*, 588; review of world literature on  $\gamma$ -radiation from, for pest control, 633
- Radioactive-tracer Methods, in studies of dispersal of insects, 14; in investigations on insecticides, 19, 27, 28; in study of metabolism of thiotepe, 39; in study of metabolism of dimethoate, 92; in study of residues of phenthoate, 93, 94; in study of metabolism of dimethoate, 116; in studies of *Dalbulus maidis* feeding on diseased aster plants, 345; in studies of *Camponotus* ants damaging forest trees, 456; book surveying use of, in entomology, 465
- Radish, *Hylemya* on, in New York, 36; *Athalia rosae* reared on, 53; *Nezara viridula* on, in Japan, 151; *Pieris brassicae* on, in India, 318; *Hylemya brassicae* on, in British Columbia, 421; *Athalia rosae ruficornis* on, in China, 483; varietal resistance of, to *Phyllotreta striolata* in North Carolina, 524
- Raffinose, effect of, on pheromone production in *Ips confusus*, 409
- Ragi (see *Eleusine coracana*)
- Rainfall, effects of, on storage of cereals, 50; not affecting numbers of *Plutella maculipennis*, 231; effect of, on flight of *Oscinella frit*, 233; effect of, on sexual maturation of *Chortioetes terminifera*; affecting winter survival of *Chortioetes terminifera*, 266; in relation to *Peregrinus maidis*, 300; effects of, on hibernation of *Anthonomus grandis*, 355; effect of, on winter survival of *Pectinophora gossypiella*, 365; in relation to *Tipula paludosa*, 467; effects of, on *Mayetiola destructor*, 487; effect of, on *Earias biplaga*, 626
- Rainwater, organochlorine insecticides in, in England, 298; residues of organochlorine insecticides in, in Britain, 618
- Raoiella indica*, distribution maps of, 401
- Rape, *Athalia rosae* reared on, 53; *Nezara viridula* on, in Japan, 151; natural enemies of pests of, in Sweden, 182; varietal resistance in, to aphids in Tasmania, 266; damage to, by *Nysius huttoni* in New Zealand, 313; *Psylliodes chrysocephalus* on, in Germany, 339; *Epicometis hirta* on, in Rumania, 461; *Athalia rosae ruficornis* on, in China, 483; *Eurydema rugosum* on, in Japan, 547; parasites of bud and stem pests of, in Germany, 618
- Raspberry, aphids on, in Poland, 96; insect pests of, in Canada, 343; *Thomasiniana theobaldi* in relation to diseases of, in Holland, 382
- Rats, metabolism of thiotepe in, 39; toxicity of insecticides to, 114; insecticide toxic to, 186; metabolism of carbaryl in, 404; metabolites of methyl- and dimethyl-carbamates formed by liver microsomes in; drug treatment reducing dieldrin storage in; metabolism of N-(mercaptomethyl) phthalimide-carbonyl- $C^{14}$ -S-(O,O-dimethylphosphorodithioate) in, 464; metabolism of dimethyl 1-methylcarbamoyl-1-propen-2-yl phosphate by, 507; fate of methyl- and dimethyl-carbamate insecticides in, 524
- Red Gram (see *Cajanus cajan*)
- Red Pine (see *Pinus resinosa*)
- Repellents, chemicals as, for honey bees, 180; for insects, 184; use of, as alternate method of pest control, 248; use of, in pest control, 288
- Reserpine, as sterilant for *Anastrepha ludens*, 359
- Resin, effect of, on development of *Anobium punctatum*, 181; inhibiting development of *Hylotrupes* larvae, 407
- Resin, Synthetic, effectiveness of suspensions of polyhedra not increased by, 43
- Reticulitermes flavipes*, distribution of, in Ontario, 204; pathology of *Entomophthora* infection in, in Indiana; susceptibility of, to *Bacillus thuringiensis* in Wisconsin, 371
- Reticulitermes hesperus*, susceptibility of, to *Bacillus thuringiensis* in Wisconsin, 371
- Reticulitermes lucifugus*, control measures against, damaging trees and timber in Italy, 329; duration of exposure in proofing of timbers against, 661
- Reticulitermes lucifugus santonensis*, attractiveness to, of substances found in fungus-attacked wood; chemical decomposition of wood, by, 406; effectiveness of contact insecticides in stored pine sapwood against, 408; infestation by, in France, 560
- Reticulitermes virginicus*, susceptibility of, to *Bacillus thuringiensis* in Wisconsin, 371
- Réunion, locusts in, 112; *Diatraeaophaga striatalis* for control of *Proceras sacchariphagus* on sugar-cane in, 557



- Reviews: Wigglesworth (Sir V.B.), Principles of insect physiology (6th revd. edn.); Müller-Kögler (E.), Pilzkrankheiten bei Insekten, 3; Mukundan (T.K.), Plant protection: principles and practice, 84; Sripathi Rao (B.), Pests of *Hevea* plantations in Malaya; Jacobson (M.), Insect sex attractants, 118; Elton (C.), Animal ecology, 119; Stoll (N.R.) & others, Ed., International Code of Zoological Nomenclature . . .; Merino-Rodríguez (M.), Elsevier's lexicon of plant pests and diseases, 119; Hocking (B.), Ed., Armed forces manual on pest control (3rd edn.), 158; Uvarov (Sir B.), Grasshoppers and locusts (vol. I); Smith (R.F.) & Mittler (T.E.), Ed., Annual review of entomology (vol. II), 184; Bei-Bienko (G. Ya), Ed., Pyatloe Soveshchanie Vsesoyuznogo Entomologicheskogo Obshchestva, 196; Das (G.M.), Pests of tea in north-east India and their control, 219; Alfaro Moreno (A.), Agricultural pesticides. Formulation and guide to application, 246; Brian (M.V.), Social insect populations, 247; Chichester (C.O.), Ed., Research in pesticides. Proceedings of the conference on research needs and approaches to use of agricultural chemicals from a public health viewpoint held at University of California, October [1964], 247-249; Cornwell (P.B.), Ed., The entomology of radiation disinfection of grain. A collection of original research papers, 249-253; Goodwin (T.W.), Ed., Aspects of insect biochemistry; Cragg (J.B.), Ed., Advances in ecological research (vol. 3); Wigglesworth (Sir V.B.), Insect physiology (6th edn.); Finney (D.J.), statistical method in biological assay (2nd edn.), 297; Ingle (L.), A monograph on chlordane. Toxicological and pharmacological properties, 346; Beament (J.W.L.), Treherne (J.E.) & Wigglesworth (V.B.), Ed., Advances in insect physiology (vol. 3); Rolston (L.H.) & McCoy (C.E.), Introduction to applied entomology, 405; Nikol'skaya (M.N.), & Yasnosh (V.A.), Aphelinids of the European part of the U.S.S.R. and the Caucasus, 437; Southwood (T. R. E.), Ecological methods with particular reference to the study of insect populations, 451; Hanson (H. C.), Diseases and pests of economic plants of Vietnam, Laos and Cambodia. A study based on field survey data and on pertinent records, material and reports, 462; Munro (J. W.), Pests of stored products, 465; O'Brien (R. D.) & Wolfe (L. S.), Radiation, radioactivity, and insects, 465; Patočka (J.), The fir Lepidoptera of Slovakia with reference to the fauna of Central Europe, 517; Eden (T.), Tea (2nd edn.); Faegri (K.) & Van Der Pijl (L.), The principles of pollination ecology; von Frisch (K.), The dancing bees. An account of the life and senses of the honey bee. Translated by Dora Isle and Norman Walker (2nd Edn.), 525; Hanson (H. C.), Diseases and pests of economic plants of central and south China, Hong Kong and Taiwan (Formosa). A study based on field survey data and on pertinent records, material, and reports, 528; Zaitsev (V. F.), Parasitic flies of the family Bombyliidae in the fauna of Transcaucasia, 549; Martínez-Zaporta (F.), Fruit-growing. Fundamentals and practice, 569; Hanson (H. C.), Diseases and pests of economic plants of Burma. A study based on field survey data and on pertinent records, material, and reports, 571; Rudd (R. L.), Pesticides and the living landscape, 574; Metcalf (R. L.), Ed., Advances in pest control research, (vol. 6), 622; Starý (P.), Aphid parasites of Czechoslovakia. A review of the Czechoslovak Aphidiidae (Hymenoptera), 630; Avidov (Z.), Ed., Studies in agricultural entomology and plant pathology, 636-637
- Rhabdionvirus oryctes*, infecting *Oryctes rhinoceros* in Malaya, 536
- Rhadinaphelenchus cocophilus*, causing red-ring disease of coconut in Trinidad, transmission of, by *Rhynchophorus palmarum*, 70; *Rhynchophorus palmarum* in felled coconut stumps contaminated with, in Trinidad, 173; causing red-ring disease in coconut, 639
- Rhadinotermes*, in Ethiopia, 467
- Rhagoletis cerasi*, bionomics, parasitism and ecology of, on cherry in Poland, 137-139; chemical control of, on cherry in Rumania, 328; tests of new insecticides against, on cherry in Poland, 514; larvae of, not affecting the mouth, 519; natural mortality of, infesting cherry in Switzerland, 617
- Rhagoletis pomonella*, on apple in New Brunswick, use of traps as indicators of activities of, 24; rearing of, 162; control of, in apple orchard in Wisconsin, 167; effects of mating on fecundity of, 203; damaging apples in Wisconsin, 279; artificial oviposition devices for, 286; insecticides against, on blueberry in Michigan, 301; trap boards baited with protein hydrolysate against, in Michigan, 352; DDT-resistance in, 642
- Rhizoberlesia*, as subgenus of *Therioaphis*, 308
- Rhizoberlesia trifolii* (see *Therioaphis brachytricha*)
- Rhizoctonia*, Collembola in relation to, on clover and grass in Holland, 383
- Rhizoeus cacticans*, effect of soil moisture on population development of, on roots of *Aechmea fasciata* in Belgium, 576
- Rhizophagus*, abundance of, in relation to *Myelophilus piniperda* in Finland, 383
- Rhodesia, Eriophyids on fruit trees, tomatoes and lawn grasses in, 71; Carabids on maize in, 72; *Eriosoma lanigerum* on apple in, beneficial insects in, 73; pests of maize, *Crotalaria juncea*, soy bean, and groundnut in, 74; tobacco viruses transmitted by *Myzus persicae* in; spray distribution on cotton in, 334; enemies of hive bees in, 394; cotton spraying equipment in, 441, 442; sprays against pests of cotton in, 474; outbreaks of *Pectinophora gossypiella* on cotton in, 475
- Rhodiaval (see O-Diethyl S-2-[Methyl-carbamoylmethylthio] ethyl Phosphorodithioate)
- Rhopaea magnicornis*, sex attraction in, 175
- Rhopaea morbillosa*, sex attraction in, 175
- Rhopaea verreauxi*, sex attraction in, 175

- Rhopalosiphoninus staphyleae*, not found on sugar-beet in Britain, 384
- Rhopalosiphum erysimi*, infesting crucifers in Poland, 139; damaging crucifers in India, control measures against, 146; distribution maps of, 401
- Rhopalosiphum erysimi pseudobrassicae*, on rape in Tasmania, 266; as synonym of *Rhopalosiphum erysimi*, 401; effects of temperature and development, longevity and reproduction of, in Japan, 438
- Rhopalosiphum fitchii*, food plants of, in Manitoba, 311
- Rhopalosiphum insertum*, interrelations between, and their parasites and hyperparasites on apple in Holland, 121; on apple in Poland, 139; transmission of barley yellow-dwarf virus by, to cereals in Czechoslovakia, 631
- Rhopalosiphum maidis*, daily rhythms in flight and development of, 305; development and reproduction of, on barley in Manitoba, 311; transmission of mosaic virus disease to cardamom and wheat in India, 317; on leek in Bulgaria, 328; as food for laboratory reared Coccinellid larvae in Canada, 348; effects of nitrogen deficiency and crowding on, on sorghum, 356; in herbicide-treated oat fields in New Brunswick, 424; morphology and identification of virus-like particles in, 537
- Rhopalosiphum padi*, specificity of transmission of barley yellow-dwarf virus to oats by, 69; insecticides against, on wheat in New Zealand, 118; in relation to barley yellow-dwarf virus in South Dakota, 292; food plants of, in Manitoba, development and reproduction of, on barley in Manitoba, 311; in herbicide-treated oat fields in New Brunswick, 424; use of, for testing toxicity of systemic insecticides absorbed by roots of wheat, 532; transmission of barley yellow-dwarf virus by, to cereals in Czechoslovakia, 631
- Rhopalosiphum ruftabdominalis*, feeding on *Cyperus esculentus* in Hawaii, 175
- Rhopobota naevana*, glycerol content and cold-hardiness of, in Norway, 423
- Rhoptromeris eucera*, attacking *Oscinella frit* in Britain, 467
- Rhothane (see DDD)
- Rhyacionia buoliana*, natural enemies of, on pine in Soviet Union, 90; on pine in Poland, 98; infestation and control of, on pine in Spain, 127; parasites of, in Germany, 237; distribution of, and its parasites and associated insects, on pine in Maryland, 304; soil fertilisers affecting infestation by, on pine in Germany, 522
- Rhyacionia duplana*, on pine in Spain, 127
- Rhyacionia frustrana*, *Trichogramma minutum* parasitising eggs of, on pine in Georgia, 590
- Rhyacionia retiferana*, *Hapleginella laevifrons* associated with, on pine in Soviet Union, 193
- Rhyacionia rigidana*, *Trichogramma minutum* parasitising eggs of, on pine in Georgia, 590
- Rhyacionia zozana*, bionomics of, on pine in California, 307
- Rhynacus breirowi*, autecological studies of, on *Magnolia grandiflora* in Georgia; mortality of, on *Magnolia fraseri* and *Magnolia soulangeana*, 414, 415
- Rhynchaenus fagi*, on beech, apple, cherry and walnut in France, insecticides ineffective against, 53; Chalcidoid parasites of, in Denmark, 239; chemical control of, damaging orchard fruits in Germany, 456; occurrence and control of, in Europe, 658
- Rhynchophorus palmarum*, in Trinidad, tests of attractants for, 41; transmitting *Rhadinaphelenchus cocophilus*, on coconut in Trinidad, 70; development of, in felled coconut trees in Trinidad, 172; as vector of *Rhadinaphelenchus cocophilus*, in Surinam, 639
- Rhyzopertha dominica*, effects of gaseous tensions on mortality of adults of, 4; effect of  $\gamma$ -radiation on, 58; suitability of climatic areas for infestation of, in stored wheat in Canada, 156; attacking stored rice in British Guiana, 172; effect of  $\gamma$ -radiation on, 252; neem-seed powder as protectant against, in stored grain in India, 259; as pests of granaries in Portugal, 387; fumigation against, in bagged wheat in India, 399; relationship of, to hot spots in stored wheat in Oregon, 489; colour characteristic for sexing live adults of, 499; in stored wheat in Iran, 519; insecticides against 622
- Ribes nigrum*, *Aphis triglochis* on, in Britain and Holland, 653
- Ribes rubrum*, *Aphis triglochis* on, in Britain and Holland, 653
- Ribonucleic Acid, for reversing effects of anti-metabolites in *Anthonomus grandis*, 277
- D-Ribose, attractive to *Eurytoma roddi*, 57
- Rice, *Graphognathus leucoloma fecundus* on, in U.S.A., 32; *Chilo suppressalis* on, in Formosa, 48; damaged by *Triops granarius* and aquatic snail in Swaziland, 132; pests of, in Soviet Union, 140; nutritional relations of *Chilo suppressalis* to; *Chilo suppressalis* on, in Japan, 147; *Laodelphax striatella* on, in Japan, 150; *Laodelphax striatellus* and stripe virus of, 151; factors affecting infestation of, by *Lissorhoptrus oryzophilus* in Arkansas, 159; *Lissorhoptrus oryzophilus* on, in California, 161; pests and diseases of, in British Guiana, 171; dwarf virus of, in *Nephotettix cincticeps*, 180; *Isotima javensis* parasitising *Tryporyza incertulas* on, in India, 219; phytotoxic effects of insecticides used as seed, foliage or soil treatments on, 263; insecticide treatment of, not affecting crawfish in Louisiana, 282; growth of *Sitotroga cerealella* as index of quality of, 296; pests of, in India, 316; *Echinocnemus oryzae* on, in India, 441; pests of, in Africa, Asia, Philippines, Indonesia, India, Pakistan and Malaya, *Diatraea saccharalis* on, in Americas, 481, 482; *Chilo suppressalis* on, in Philippines, 494; pests of, in Iran, 519; *Leptocoris* on, in Far East, 527; insecticide treatment of, against *Chilo polychrysa*, in Malaya, 527; *Nephotettix cincticeps* on, in Japan, 545; *Oryzaephilus surinamensis* on, in Far East, 601; pests of, in Philippines, 615; review of work on pests of, in Malaysia, 619;



- effect of *Oebalus poecilus* on yield and quality of, in Guyana, 638
- Rice Bran, malathion residues in, 56; extracts of, terminating diapause in *Plodia interpunctella*, 548
- Rice Flour, productivity and development of *Tribolium* spp. on, 503
- Rice (Stored), effect of particle size of, on control of *Tribolium castaneum* by malathion, 146; pests of, in British Guiana, 172; *Sitophilus* spp. in, in Portugal, 387; piperonyl butoxide residues in, following paper bag treatment, 487
- Ricinus communis*, *Spatulifimbria castaneiceps* on, in India, 260; *Clania crameri* on, in India, 262; *Achaea janata* on, in India, 318; *Euproctis fraterna* on, in India, 440; hybrids of *Tetranychus telarius-cinnabarinus* complex on, in Spain, 658
- Rickettsiae, control of insects by, 240
- Robinia pseudacacia*, *Thyridopteryx ephemeraeformis* on, in Virginia, 29; leaf-mining insects on, in U.S.A., 116
- Robusta Coffee (see *Coffea canephora*)
- Rodolia cardinalis*, established against *Icerya purchasi* in Iran, 519
- Rogor (see Dimethoate)
- Rogas, effect of insecticide dusts on parasitism by, in *Bupalus piniarius* in Soviet Union, 190; parasitising *Mocis repanda* in Venezuela, 212
- Rogas aciculatus*, parasitising *Heliothis* spp. in U.S.A., 539
- Rogas circumscriptus*, *Gymnoscelis pumilata* parasitised by, 608
- Rogor 40 (see Dimethoate)
- Rogor L40 (see Dimethoate)
- Rolled Oats, in diet for *Aeroglyphus robustus*, 495
- Ropalopus clavipes*, infesting elms in Soviet Union, 143
- Ropalopus macropus*, infesting elms in Soviet Union, 143
- Rorippa amphibia*, *Aphis triglochis* in relation to, in Britain and Holland, 653
- Rorippa islandica*, *Aphis triglochis* in relation to, in Britain and Holland, 653
- Rorippa sylvestris*, *Aphis triglochis* in relation to, in Britain and Holland, 653
- Rosa*, *Ceratitis capitata* on, in Tunisia, 244
- Rosa canina*, *Typhlocyba rosae* on, in Bulgaria, 197
- Rose, *Aonidiella aurantii* on, in India, 85; *Typhlocyba rosae* on, in Bulgaria, 197; sprays not affecting, 263; *Tetranychus telarius* on, in Maryland, 287; *Epichorista ionephela* on, 345; systemic acaricide treatment of *Tetranychus telarius* on, in Florida, 358; *Bulgaria-leurodes cotesii* on, in Soviet Union, 510; *Cladius pectinicornis* on, in Bulgaria, 556; *Gymnoscelis pumilata* on, in Sicily, 608; *Tetranychus telarius* on, in Holland, 652
- Rose-of-Sharon (see *Hibiscus syriacus*)
- Rosmarinus officinalis*, *Chrysomela americana* on, in Italy, 331
- Rospin (see Chloropropylate)
- Rotenone, toxicity of, to *Coccinella septempunctata*, 85; mode of action of, 184; thin-layer chromatography of, and related compounds, 524; against *Psylla pyricola*, 643
- Roxion (see Dimethoate)
- Royal Palm (see *Oreodoxa regia* and *Roystonea regia*)
- Roystonea regia*, *Xylastodoris luteolus* on, in Florida, 543-545
- RP-9349 (see O,O-Diethyl S-2-(Methylcarbamoylmethylthio) ethyl Phosphorodithioate)
- RP-9599 (see O,O-Diethyl S-2-(1-Methylcarbamoylethylthio) - ethyl Phosphorodithioate)
- RP-11974 (see Phosalone)
- Rubber (see also Hevea)
- Rubber, *Nacoleia diemenalis* on cover crops for, in Malaya, 41
- Rubber, termites attacking, 240
- Rubus*, in relation to insect pests in orchards, 381
- Rubus idaeus*, *Argilus aurichalceus* and *Coraebus rubi* on, in Yugoslavia, 569
- Rumania, *Zabrus tenebrioides* on wheat in; wireworms on wheat in, 90; *Ostrinia nubilalis* on maize in; *Tychius flavus* on lucerne in; *Leptinotarsa decemlineata* on potato in, 91; *Tetranychus telarius* on vegetable crops in, 247; *Lithocolletis blancardella* mining the leaves of apple in, parasites of *Lithocolletis blancardella* in; *Rhagoletis cerasi* on cherry in, 328; *Anarsia lineatella* in, 333; use of insecticides on crop plants in, 461; *Chlorops pumilionis* and *Oscinella frit* on barley and oats in, 462
- Rumen Fluid (of cattle), conversion of DDT to DDD by, 374
- Rupella albinella*, food plants and parasites of, attacking rice in British Guiana, 171
- Rutabaga (see Swede)
- Rutin, effect of, on *Heliothis* spp., 280; as feeding stimulant for *Anthonomus grandis*, 281
- Ryania, in sprays against apple pests, 360; toxicity of, in sprays, to predacious insects, 471
- Rye, harvest of, in relation to *Hyponomeuta padellus malinellus*, 98; *Haplodiplosis equestris* on, in Germany, 100; *Hylemya coarctata* on, in Germany, 294; *Lema melanopa* on, in Indiana, 307; protection of, from pests in Soviet Union, 319; thrips on, in Holland, 341; *Haplodiplosis equestris* on, in Germany, 380; *Eurygaster integriceps* on, in Bulgaria, 554
- Rye-grass (see *Lolium perenne*)

## S

- S421 (see Octachlorodipropyl ether)
- Sacadodes pyralis*, insecticides against, on cotton in Colombia, 211
- Saccharicoccus sacchari*, on sugar-cane in Somalia, 38
- Saccharose, effect of, on development of *Ceratitis capitata*, 244
- Saccharosydne saccharivora*, relation between fecundity in, and nitrogen content of sugar-cane in Jamaica, 289
- Sacking, persistence of insecticide deposits on, 622

- Safflower (see *Carthamus tinctorius*)  
 Saproxan, not improving residual action of pyrethrins, 225; in dusts against pests of stored maize, 394  
*Sahlbergella singularis*, relation of diet to egg production of; influence of light intensity on oviposition by, 109; sprays against, on cacao in Ghana, 333; occurrence of, on cacao in Nigeria; tests for resistance to insecticides in; methods for rearing, 626  
*Sainfoin* (see *Onobrychis viciifolia*)  
*Saissetia hemisphaerica*, *Verticillium lecanii* against, on coffee in Costa Rica, 242  
*Saissetia nigra*, feeding on *Cyperus rotundus* in Hawaii, 175  
*Saissetia oleae*, bionomics of, on olive, *Pistacia terebinthus*, *Lotus corniculatus*, hawthorn and ash, in Greece, 52; on olive in Italy, 94; parasite complex of, 205; sprays against, on *Citrus* in Florida, 207, 208; annual cycle and control of, on *Citrus* and olive in Israel, 400; *Chilocorus bipustulatus* predacious on, on olive in California, 543  
*Salebria semirubella sanguinella*, bionomics and control of, on lucerne in Bulgaria, 198  
 Salina, use of *Opius concolor sicularis* against *Dacus oleae* in, 607, 608  
*Salix alba*, overwintering eggs of *Cavariella aegopodii* on, in Britain, 533  
*Salix americana*, *Oberea oculata* on, in Yugoslavia, 6  
*Salix amygdalina*, *Oberea oculata* on, in Yugoslavia, 6  
*Salix babylonica*, overwintering eggs of *Cavariella aegopodii* not found on, in Britain, 533  
*Salix caprea*, *Oberea oculata* on, in Yugoslavia, 6; overwintering eggs of *Cavariella aegopodii* on, in Britain, 533  
*Salix cinerea*, overwintering eggs of *Cavariella aegopodii* on, in Britain, 533  
*Salix fragilis*, overwintering eggs of *Cavariella aegopodii* on, in Britain, 533  
*Salix purpurea*, *Oberea oculata* on, in Yugoslavia, 6  
*Salix viminalis*, *Oberea oculata* on, in Yugoslavia, 6; overwintering eggs of *Cavariella aegopodii* on, in Britain, 533  
 Sal Soda, used in removing insecticide deposits from contaminated cages, 275  
 Salsola Kali, survival of *Heterographis fulvobasella* on, 165  
 Salt, in diet for *Anthrenus flavipes*, 441; in diet for *Tribolium* spp., 503; in diet for *Agria affinis*, 604  
*Saluria*, in Africa, 481  
*Salvia*, *Phrydiuchus* on species of, 273  
*Salvia aethiops* use of *Phrydiuchus* spp. for control of, in United States, 273  
*Salvia sclarea*, *Phrydiuchus topiarius* on, 273  
*Salvia verbenaca*, *Phrydiuchus topiarius* on, 273  
*Sambucus nigra*, flowering of, in relation to *Hyponomeuta padellus malinellus*, 98  
*Samia cynthia ricini*, effect of insecticides on blood cells of, 662  
 Samoa, Western, control of *Oryctes rhinoceros* in, 313  
*Sancassania*, from larvae of *Phyllognathus silenus*; *Nosema bombycis* transmitted by, to *Bombyx mori* in Czechoslovakia, 345  
*Saperda carcharias*, factors affecting infestation by, on poplar in Czechoslovakia, 8; infesting poplar in Soviet Union, 193  
*Saperda populnea*, infesting poplar in Soviet Union, 193; *Stilpnotia salicis* attacking trees damaged by, in Austria, 521  
*Saperda punctata*, infesting elms in Soviet Union, 143  
*Sapota* (see *Achras zapota*)  
 Sarawak, *Oryzaephilus surinamensis* in, 601  
*Sarcophaga lambens*, parasitising *Mocis repanda* in Venezuela, 212  
 Sardinia, coccids on orange in, 95; introduction of *Formica lugubris* to mixed forests in, 628  
 Saskatchewan, *Pachygonatopus minimus* as parasite of *Macrosteles fascifrons* in, 156; ecology of outbreaks of *Camnula pellucida* in, 310; *Aeroglyphus robustus* infesting stored grain in, 495  
*Sathrobrota* gen.n., *Pyroderces rileyi* Wlsm. type sp., in America, 545  
*Sathrobrota badia*, sp.n., misidentified as *S. rileyi*, in America, 545  
*Sathrobrota rileyi*, *Sathrobrota stigmatophora* as synonym of, 545; in relation to *Sitophilus oryzae* and *Heliothis zea* damaging maize in U.S.A., 588  
*Sathrobrota stigmatophora*, as synonym of *Sathrobrota rileyi*, 545  
 Saudi Arabia, mortality of *Schistocerca gregaria* due to high velocity wind in, 146; *Ectomyelois ceratoniae* attacking pomegranate in, 211; *Schistocerca gregaria* in, 597  
 Sayphos (see Menazon)  
 Scale Insects, natural enemies of, 60; of Florida, 71  
*Scaphoideus littoralis*, insecticide control of; transmission of golden-flavescence disease by, to vines in France, 458; DDT in sprays against, on vines in France, 459  
*Scapteriscus acletus*, temperature affecting activity of, on tobacco in Florida, soil treatments against, in shade tobacco plant beds in Florida, 207  
*Scapteriscus didactylus*, infestation and control of, on rice in British Guiana, 172  
*Scapteriscus vicinus*, temperature affecting activity of, on tobacco in Florida, soil treatment against, in shade tobacco plant beds in Florida, 207  
*Scelio fulgidus*, parasitising *Chortoicetes terminifera* in Australia, 266  
*Scelio zolotarevskyi*, parasitising locusts in Mauritius, 112  
*Sceliphron figulum*, preying on *Mocis repanda* in Venezuela, 212  
 Scents, for attracting insects, 399  
 Schering 36268 (see N-(2-methyl-4-chlorophenyl)-N',N'-dimethyl-formamidine)  
*Schistocerca gregaria*, in Afghanistan, Iran, Iraq and Pakistan, migration of, to Soviet Central Asia, 16; report on, in Somalia, Ethiopia, Sudan, French Somaliland, Arabia, Yemen, India and West Pakistan, and insecticides against, 50; in India, Pakistan and West Africa, 111; effect of  $\gamma$ -radiation on, 145; mortality of, due to high velocity wind in Saudi Arabia, 146; duration of toxicity of dieldrin against, in India, 219; insecticides



- as stomach poisons against hoppers of, in India, 317; occurrence and activity of, in Soviet Union, 433; allatectomy affecting sexual maturation of young males of, 524; effects of  $\gamma$ -radiation on eggs of, 531; toxicity of concentrated sprays to 593; infestation by, in India, Pakistan and East Africa; factors affecting body temperature of, 597; effect of aromatic shrubs on sexual maturation in, 605; symposium on development of, in relation to environmental factors, 620
- Schizolachnus piniradiatae*, method of rearing, on *Pinus resinosa* in Ontario, 44
- Schizonycha*, on banana in Somalia, 380
- Schradan, against *Contarinia* and *Megastigmus spermatrophus*, 44; in sprays against *Tetranychus telarius*, 232; toxicity of, to *Sitophilus oryzae*, 261; phytotoxicity of, to seeds and plants; favouring leaf-spot disease caused by *Alternaria* sp., 263; residues of, in plants, used against *Tetranychus telarius*, 461
- Sciara*, use of scents to attract, in Britain, 399
- Sciopithes obscurus*, factors affecting fecundity of, on strawberry in British Columbia, 18; effect of plant nutrition on fecundity of, on strawberry in British Columbia, 268; tolerance of larvae of, to soil insecticides in British Columbia, 422
- Scirpophaga*, in Africa, 481, 482
- Scirpophaga bivitta*, on rice in British Guiana, 171
- Scirpophaga nivella*, assessment of losses of sugar-cane caused by in India, 48; *Isotima javensis* parasitic in, on sugar-cane in India, 219; tests of isobenzan and other insecticides against, in India, 479
- Scirpus grossus*, *Chilo polychrysa* on, in Malaya, 527
- Scirtothrips bispinosus*, side-effects of sprays against, on tea in India; insecticides against, on tea in India, 397, 398; mist-blower for applying insecticides against, on tea in India, 398
- Scirtothrips dorsalis*, bionomics of, on tea in India, 217
- Sclerotinia cinerea*, and fruit flies, control of, on peach in Brazil, 243
- Scolia oryctophaga*, unsuccessful against *Oryctes rhinoceros* in India, 313
- Scolia procer*, parasitising *Oryctes rhinoceros* in Malaya, 178
- Scolia ruficornis*, released against *Oryctes rhinoceros* in Malaya, 178; unsuccessful against *Oryctes rhinoceros* in India, 313
- Scolothrips sexmaculatus*, as predator of *Panonychus citri* in Formosa, 315; predacious on *Tetranychus telarius* in California, 365
- Scolytidae, Hymenopterous parasites of, 155; list of parasites of, in North America, 309; control of, on crops in Italy, 390
- Scolytus ensifer*, seasonal development of, on elm in Soviet Union, 89
- Scolytus kirschi*, seasonal development of, on elm in Soviet Union, 89
- Scolytus multistriatus*, seasonal development of, on elm in Soviet Union, 89; *Aulonium trisulcum* preying on, on elm in Spain, 128; transmitting *Ceratocystis ulmi* causing Dutch elm disease in Quebec, 502
- Scolytus pygmaeus*, seasonal development of, on elm in Soviet Union, 89
- Scolytus quadrispinosus*, bionomics of, in Wisconsin, factors affecting attraction of, to *Carya*, 65
- Scolytus scolytus*, seasonal development of, on elm in Soviet Union, 89; *Aulonium trisulcum* preying on, on elm in Spain, 128; on elm in Soviet Union, 142; development of population tables for, on elm in Britain, 650
- Scolytus sulcifrons*, status and bionomics of, on elm in Soviet Union, 142
- Scolytus ventralis*, factors affecting mortality of, on *Abies concolor* in California, 170
- Scoparia truncicolella*, parasitised by *Lissonota dubia* and *Apanteles parasitellae* in Germany, 564
- Scotland, viral control of *Neodiprion sertifer* on pine in, 432
- Scrobipalpa ocellatella*, factors affecting efficiency of insecticides against, on sugar-beet in Rumania, 461
- Scutellista cyanea*, attacking eggs of *Ceroplastes rusci*, 99
- Scutigerella immaculata*, infection of, with nematode DD-136, 572
- Scymnus*, predacious on eggs of *Heliothis zea* in Arkansas, 416; predacious on *Aphis sacchari* and *Aphis indosacchari* in India, 479
- Scymnus suturalis*, preying on *Aradus cinnamomeus* in Czechoslovakia, 454
- Scythropus mustela*, on *Pinus sylvestris* in Czechoslovakia, 102
- SD 4072 (see Chlorfenvinphos)
- SD-4741 (see O,O,O-Trimethyl Phosphorothioate)
- SD-5562 (see Dimethyl 1-Dimethylcarbamoyl-2-chloro-1-propen-2-yl Phosphate)
- SD-7438 (see Toluene- $\alpha,\alpha$ -dithiol bis (O,O-Dimethyl Phosphorodithioate))
- SD-7859 (see Chlorfenvinphos)
- SD-8280 (see Dimethyl 2-Chloro-1-(2,4 dichlorophenyl)vinyl Phosphate)
- SD-8436 (see Dimethyl 2-Chloro-1-(2,4-dibromophenyl)vinyl Phosphate)
- SD-8447 (see Dimethyl 2-Chloro-1-(2,4,5-trichlorophenyl)vinyl Phosphate)
- SD-8530 (see 3,4,5-Trimethylphenyl Methylcarbamate)
- SD-9129 (see Dimethyl 1-Methylcarbamoyl-1-propen-2-yl Phosphate)
- Selenothrips rubrocinctus*, on cacao in Trinidad, factors determining feeding sites of, 74; *Teratophylidea opaca* preying on, on cacao in Dutch Guiana, 171
- Selinon (see DNC)
- Selinon Neu, formulation of DNC, 98
- Semiadalia undecimnotata*, natural enemies of, 104; host-specificity and micro-distribution of, attacking aphids in France, 559
- Senecio vulgaris*, aphids on, in Britain, 384; *Aphis gossypii* on, in France, 457; overwintering and transmission of phyllody virus to, by *Euscelis plebeja*, 578
- Sesame (see *Sesamum*)

- Sesamex, as synergist with Bidrin, effects of, on bioassay of Bidrin; toxicity of, to cotton, treatment of soil with, 28
- Sesamia calamistis*, in Africa, 481, 482
- Sesamia cretica*, associated with *Chilo partellus* on sorghum in Somalia, 380; effects of insecticide treatments against, on maize in Egypt, 472
- Sesamia inferens*, on mature sugar-cane in India, 479; in Asia, biological control of, in Philippines, 481, 482; insecticides against, on rice in Philippines, 615
- Sesamia nonagrioides botanephaga*, in Africa, 481, 482
- Sesamum orientale*, *Heliothis* on, in Texas, 42
- Antigastra catalaunalis* on, in India, 216; pests of, in Somalia, 380
- Sesbania grandiflora*, *Xyleutes strux* on, 178
- Setaria*, not successful as food plant for *Lema melanopa* in Indiana, 307
- Setora nitens*, distribution map of, 617
- Sevin (see Carbaryl)
- Sheep, DDT residues in depot fat of, in New Zealand, 312
- Shell SD-8447 (see Dimethyl 2-Chloro-1-(2,4,5-trichlorophenyl)vinyl Phosphate)
- Shell SD-9020 (see O,O-Dimethyl O-2-Chloro-1-(2,4-dichlorophenyl)vinyl Phosphorothioate)
- Shell SD-9098 (see O,O-Diethyl O-2-Chloro-1-(2,5-dichlorophenyl)vinyl Phosphorothioate)
- Shell SD-9129 (see Dimethyl 1-Methylcarbamoyl-1-propen-2-yl Phosphate)
- Shepherd's Purse (see *Capsella bursapastoris*)
- Shikimic Acid, repellent to *Eurytoma roddi*, 57; with sucrose stimulating feeding by *Choristoneura fumiferana* on *Picea glauca*, 158
- Shortleaf Pine (see *Pinus echinata*)
- Shorts, insecticide residues in, 91
- Sicily, Coccids on orange in, 45; *Tetranychus telarius* and Coccids on *Citrus* in, 257; *Contarinia citri* damaging *Citrus* flowers in, 606; *Lixus algerus* on broad bean in, 606;
- Cryptolaemus montrouzieri* controlling *Planococcus citri* on *Citrus* in, 607; *Cryptoblabes gnidiella* attacking *Citrus* in, 608; *Gymnoscelis pumilata* in, 608; *Cadra cautella* attacking *Citrus* in; *Epilachna chrysomelina* in, 609; *Nepticula heringella* on *Quercus ilex* in; bees collecting red lead paint in; *Tropinota squalida* and *Epicomis hirta* in vineyards in, 610; *Lytta vesicatoria* and *Omophlus lepturoides* damaging olive trees in, 611
- Sicus ferrugineus*, species resembling, infesting honey bees in Soviet Union, 437
- Sideroxylon foetidissimum*, *Ceropsylla sideroxyli* on, in Florida, 543-545
- Sierra Leone, *Stenocoris southwoodi* in, 527
- Sig lure, combined with trichlorphon in traps for *Ceratitidis rosa* and *C. capitata*, 130
- Silica Gel, protecting packaged food from insect infestation, 277
- Silk, production of, 196
- Simmondsius pakistanensis* gen. et sp.n., feeding on *Parlatoria oleae* on pine in Pakistan, 295
- Singapore, *Oryzaephilus surinamensis* in, 601
- Singhara (see *Trapa bispinosa*)
- Sinigrin, stimulating oviposition by *Hylemya brassicae*, 289; effect of, on feeding of *Pieris brassicae*, 292; in diets for *Pieris brassicae*, 448; stimulating feeding by *Pieris brassicae*, 599
- Sirex*, introduction of *Stereum chailletii* to living trees by, in Canada, 309
- Sirex aerolatus*, infesting *Libocedrus decurrens* in California, parasitised by *Ibalia ensiger*, 68
- Sisyrropa painei*, released against *Nacoleia octasema* on banana in Fiji, 177
- Sitka Spruce (see *Picea sitchensis*)
- Sitodiplosis mosellana*, DDT for control of, on wheat in British Columbia, 422
- Sitona* granular insecticides protecting pea seedlings from, in Soviet Union, 321; infesting clover in Soviet Union, 552
- Sitona concavirostris*, infesting leguminous crops in Israel, 612
- Sitona crinitus*, bionomics of, on leguminous crops in Israel, 447; control of, damaging leguminous crops in Soviet Union, 550; infesting leguminous crops in Israel, 612
- Sitona cylindricollis*, insecticides against, on *Melilotus* in Alberta, 40; control measures against, on lucerne in Turkmenia, 323; infesting leguminous crops in Israel, 612
- Sitona flavesceus*, control of, damaging leguminous crops in Soviet Union, 550
- Sitona fronto*, control measures against, on lucerne in Turkmenia, 323
- Sitona hispidulus*, bionomics of, on leguminous crops in Israel, 447; control of, damaging leguminous crops in Soviet Union, 550; infesting leguminous crops in Israel, 612
- Sitona lineatus*, bionomics of, on leguminous crops in Israel, 447; control of, damaging leguminous crops in Soviet Union, 550; infesting leguminous crops in Israel, 612
- Sitona lividipes*, bionomics of, on leguminous crops in Israel, 447; infesting leguminous crops in Israel, 612
- Sitona manifestus* (see *Mesagroicus manifestus*)
- Sitona scissifrons*, parasitised by *Centistes lituratus* in Canada, 202
- Sitona sulcifrons*, control of, damaging leguminous crops in Soviet Union, 550; insecticides against, on clover in Soviet Union, 552
- Sitona suturalis*, control of, damaging leguminous crops in Soviet Union, 550
- Sitona tibialis*, control of, damaging leguminous crops in Soviet Union, 550
- Sitona waterhousei*, control of, damaging leguminous crops in Soviet Union, 550
- Sitophilus granarius*, determination of resistance of, to  $\gamma$  BHC, 3; feeding preferences of, 5; development of, within grains of wheat, 39; archaeological records of, in Egypt, 56; effect of  $\gamma$ -radiation on, 58; in relation to *Plinius tectus* in stored wheat, 76; amount of grain consumed by, 79; suitability of climatic areas for infestation of, in stored wheat in Canada, 156; O,O-diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate against, in stored wheat, 160; toxicity of synergised pyrethrum to, susceptibility of, to insecticides, 225; susceptibility of, to  $\gamma$ -radiation, 249, 250; effect of temperature on susceptibility of, to  $\gamma$ -radiation; effects of continuous and fractionated doses of  $\gamma$ -radiation on; effect of culture environment on susceptibility of, to  $\gamma$ -radiation, 250, 251; effects of sterilising



- and substerilising doses of  $\gamma$ -radiation on, 251; susceptibility of, to  $\gamma$ -radiation, comparison of susceptibility of, to accelerated electrons and  $^{60}\text{Co}$   $\gamma$ -radiation, 252-253; effect of dose rate on response of, to  $^{60}\text{Co}$  gamma radiation, 253; elimination of symbionts of, fumigated with methyl bromide in Ontario, 372; as pest of granaries in Portugal, 387; relationship of, to hot spots in stored wheat in Oregon, 489; high-frequency electrical fields for control of, in stored wheat, 490; tests of chlorbicyclen and DDT against, in Poland, 513; in stored wheat in Iran, 519; susceptibility of developmental stages of, to methyl bromide, 600; insecticides against, 622
- Sitophilus oryzae*, determination of resistance of, to  $\gamma$  BHC, 3; factors affecting development of; responses of, in Queensland to insecticides, 4; effect of  $\gamma$ -radiation on, 58; factors affecting the susceptibility of sorghum to, in Tanganyika, 73; insecticides against, in stored sorghum in Nigeria, 77; survey of data on characters and habits of, in Japan, 78; insecticides against, in stored sorghum in South Africa, 82; in tests of toxicity of insecticides, 86; toxicity of compounds of pyrethrum to, 112, 113; suitability of climatic areas for infestation of, in stored wheat in Canada, 156; attacking stored rice in British Guiana, 172; fumigants against, destroying *Cheyletus eruditus* in stored grain in Czechoslovakia, 201; comparative toxicity of insecticides to, 217; susceptibility of, to  $\gamma$ -radiation, 252; neem-seed powder as protectant against, in stored grain in India, 259; susceptibility of, to insecticides, 261; tests with Bromocyclen as protectant for stored wheat against, in Georgia, 364; as pest of granaries in Portugal, 387; size and weight of *Sitophilus zeamais* and, reared on cereals in U.S.A., 417; high-frequency electrical fields for control of, in stored wheat, 490; tests of chlorbicyclen and DDT against, in Poland, 513; on rice in Iran, 519; comparative effectiveness of fumigants against, in wheat in Kansas, 542; *Sathrobrotia rileyi* in relation to, on maize in United States, 588; effects of sorghum varieties on longevity of, in California, 602
- Sitophilus zeamais*, determination of resistance of, to  $\gamma$  BHC, 3; responses of, in Queensland to insecticides, 4; varietal susceptibility of sorghum to, 64; survey of data on characters and habits of, in Japan, 78; susceptibility of, to  $\gamma$ -radiation, 249, 252; as pest of granaries in Portugal, 387; dust treatments against, in stored maize in Kenya, 394; size and weight of *Sitophilus oryzae* and, reared on cereals in U.S.A., 417; insecticides against, 622
- Sitotroga cerealella*, effect of  $\gamma$ -radiation on, 58; insecticides against, in stored grain in Nigeria, 77; insecticides against, in stored sorghum in South Africa, 82; reproductive system and fecundity of, in South Africa, 131; attacking stored rice in British Guiana, 172; growth of as index of quality of rice, 296; as pest of granaries in Portugal, 387; *Bacillus thuringiensis galleriae* with  $\gamma$ -BHC in spray against, 432, 433; dusts against, and Hymenopterous parasites in, in maize stored in cribs in Kenya, 442; effects of  $\gamma$ -radiation on, 495; in stored wheat in Iran, 519; losses caused by, infesting maize, 585
- Skatole, in baits for *Rhynchophorus palmarum*, 42
- SKF525A (see 2-Diethylaminoethyl 2,2-Diphenyl-n-pentanoate)
- Slash Pine (see *Pinus elliottii*)
- Slugs, alternatives to organochlorine insecticides against, in potatoes in Britain, 386
- Sminthurinus*, on grass and white clover in Holland, in relation to injurious fungi, 383
- Sminthurus viridis*, injuring lucerne in Tunisia, 393
- Smithiavirus pectinophorae* sp.n., isolated from *Pectinophora gossypiella* in U.S.A., 536
- Smithiavirus pityocampae*, on pine, 56
- Snail (see also *Helisoma trivolvis*)
- Snail, African (see *Achatina fulica*)
- Snail, damage to rice by, in Swaziland, 132
- Snap Bean, persistence of dimethoate on, and aphids on, in U.S.A., 363
- Snow, residues of organochlorine insecticides in, in Britain, 618
- Soap, in sprays against *Dacus cucurbitae*, 265
- Sodium Arsenate, as standard of comparison for preparations of *Bacillus thuringiensis* against larvae of *Pieris rapae* and *Lymantria dispar*, 429
- Sodium Arsenite, persistence of, in soil for control of subterranean termites; bioassay of, using *Coptotermes formosanus*, 587
- Sodium Ascorbate, in rearing medium for *Spodoptera littoralis*, 104
- Sodium Benzoate, in diet for *Diatraea saccharalis*, 268
- Sodium Dioctyl Sulphosuccinate, pyrethrum formulated in, 82
- Sodium Fluosilicate, with BHC and DDT, in dusts against *Phyllotreta vittula*, 633
- Sodium Hydroxide, in baits for *Dacus oleae*, 578
- Sodium Hypochlorite, and Triton X-100 against pathogens of *Anthonomus grandis*, 363
- Sodium Salt of N-(3,4-dichlorophenyl)-N'-2-(2-sulpho-4-chlorophenoxy)-5-chlorophenyl-urea, mothproofing of wool with, 185
- Sogatella furcifera*, distribution map of, 401; transmitting stunting virus disease of *Digitaria decumbens* in British Guiana, 638
- Sogatodes braziliensis*, new synonym of *S. orizicola*, 116
- Sogatodes orizicola*, *S. braziliensis* new synonym of, 116; distribution map of, 401
- Soil, detoxication and synergism of Bidrin in, 28; insecticide residues in, 32, 45; effects of MCPA on fauna of, 75; persistence of insecticides in, effects of insecticides on fauna of, 80; treatments of, against wireworms, 90; types of, in relation to *Piesma quadratum*, 97; humidity of, in relation to *Haplodiplosis equestris*, 100; insecticides applied to, 147; attack by *Pissodes strobi* on *Pinus strobus* in relation to types of, 159; carbaryl residues in, 186; moisture and type of, affecting oviposition by *Melanoplus sanguinipes*, 205; effect

- of moisture in, on hatching of *Locusta migratoria manilensis*, 221; insecticides applied to, 231; behaviour of chlorinated insecticides in; behaviour of organic insecticides in; machine for separating Tipulid larvae from, 240; types of, in relation to insecticides, 242; persistence of insecticides in, insecticide residues in; removal of pesticide residues from, 248; insecticide treatment of, 281; flotation technique for extracting organisms from; extraction of arthropod eggs from, 296; persistence of insecticides in, 357; persistence and degradation of insecticides in different types of, 359; types of, in relation to insecticides, 395; insecticide residues in, 419; persistence of insecticides in, 450; portable, power-driven sifter for studies of insects in, 463; persistence of insecticides in, 485; method of recovering eggs of *Diabrotica virgifera* from, 494; effects of  $\gamma$  BHC on microfauna of, 517; movement of systemic insecticides in, 532; effects of moisture in, on population of *Rhizococcus cacticans*, 576; persistence of dieldrin in, from cranberry bogs, 586; types of, in relation to insecticides; persistence of insecticides in, 587; insecticide distribution in, following application by soil injector rod, 640
- Solanum dulcamara*, *Liriomyza bryoniae* on, in Azores, 112; *Leptinotarsa decemlineata* on, 575
- Solanum indicum*, insect pests of, in India, 238
- Solanum luteum*, *Leptinotarsa decemlineata* on, 575
- Solanum melongena*, stolbur virus disease of, in Bulgaria, 198; *Tetranychus telarius* on, in Rumania, 247; persistence of DDT and BHC residues on, 260; *Phthorimaea operculella* on, in Israel, 339; effect of insecticide treatment on, against *Tetranychus marianae* in Texas, 415; insecticide residues on, 461; *Euzophera osseatella* on, in Israel, Egypt, and other Mediterranean countries, 611; insecticides against *Phthorimaea operculella* on, 613; damaged by *Leptinotarsa decemlineata* in Soviet Union, 635; *Tetranychus telarius* on, in India, 662
- Solanum nigrum*, insect pests of, in India, 238
- Solanum pseudocapsicum*, aphids on, 24
- Solanum trilobatum*, insect pests of, in India, 238
- Solenopsis saevissima richteri*, side effects of treatments against, in Florida, 209; control of, with 1,2,3,4,5,6,7,8-nonachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan in Mississippi, 367
- Solvinox (see Disulfoton)
- Somalia, *Schistocerca gregaria* in, 51; pests of cultivated plants in, 380; *Schistocerca gregaria* in, 597
- Somaliland, French, *Schistocerca gregaria* in, 51
- Sooty Mould, on honeydew secreted by *Rhopalosiphum erysimi*, 146; associated with *Bemisia tabaci*, 401
- Sorbic Acid, in diet for *Ips calligraphus*, 209
- Sorbitol, in relation to supercooling point of winter eggs of *Panonychus ulmi*, 424; containing  $^{14}\text{C}$  transferred from *Psylla pyricola* to pear seedlings, 621
- Sorbus*, aphids on, 55; *Rhopalosiphum fitchii* on, in Manitoba, 311
- Sorbus aucuparia*, ripening of fruits of, in relation to *Hyponomeuta padellus malinellus*, 98; *Argyresthia conjugella* on, in Soviet Union, 190
- Sorex cinereus cinereus*, establishment of, against *Pristiphora erichsonii* in Newfoundland, 501
- Sorghum, *Tanymecus dilaticollis* on, in Yugoslavia, 6; detection of *Contarinia* larvae in heads of in U.S.A., 35; factors governing storage of, in Nigeria, 50; *Schistocerca gregaria* on, in Ethiopia, 51; *Lachnosterna* on, in India, 85; seed treatment of, 111; *Diatraea saccharalis* on, in British Guiana, 172; attacked by *Mocis repanda* in Venezuela, 212; damaged by *Tanymecus indicus* in India, 214; *Chilo partellus* on, in India; seed-furrow treatment of, *Atherigona indica* on, in India, 262; varietal resistance or susceptibility of, to *Tribolium castaneum* in India, 295; pests of, in India, 316; *Oligonychus indicus* and insecticide residues on, in India, 318; *Rhopalosiphum maidis* on, 356; *Conoderus* sp. and *Lachnosterna cribrata* on, in Texas, 364; pests of, in Somalia, 380; *Contarinia sorghicola* and associated Hymenoptera on, in Italy, 389; *Sitophilus* spp. in relation to, in U.S.A., 417; *Chilo partellus* on in India, 440; *Petrobia latens* on, in Queensland, 449; insecticide residues in grain of, in Texas, 464; varietal effects of, on longevity of *Sitophilus oryzae* in California, 602; *Gymnoscelis pumilata* on, in Sicily, 608; *Contarinia* sp. on, in Uruguay, 640; development of *Heliothis zea* and *Spodoptera frugiperda* on, 649; *Thosea aperiens* on, in India, 663
- Sorghum (Stored), varietal susceptibility of, to *Sitophilus zeamais*, 64; factors affecting the susceptibility of, to attack by *Sitophilus oryzae*, 73; pests of, in Nigeria, 77; measures against pests of, in South Africa, germination of, enhanced by pyrethrins, 82; contamination with BHC in, in Nigeria, 133; effect of particle size of, on control of *Tribolium castaneum* by malathion, 146
- Sorghum vulgare*, *Pseudaletia unipuncta* on, in India, 260; phytotoxic effects of insecticides used as seed, foliage or soil treatments on, 263
- Sound, effect of amplified, on *Plodia interpunctella*, 34
- Southern peas (see *Vigna unguiculata*)
- Soy Bean, effects of, on populations of *Oscinella frit*, 13; pests of, in Rhodesia, 74; *Spissistilus festinus* on, 162; *Leguminivora glycinivorella* on, in China, 220; varietal resistance of, to *Leguminivora glycinivorella* in China, 221; *Matsumuraesia phaseoli* on, in China, 264; dimethoate residues on, in Georgia, 273; *Popillia japonica* on, in Illinois, fat content in relation to insecticide contamination of, 281; sampling of predacious arthropods on, in Arkansas, 302; persistence of dimethoate on, and aphids on, in U.S.A.,



- 363; *Heliothis zea* on, in Louisiana, 367; seed treatment of, attacked by termites in Tanganyika, 445; *Stomopteryx subsecivella* on, in China, 483; *Trichoplusia ni* and *Pseudoplusia includens* on, in Alabama, 498; *Elasmopalpus lignosellus* on, in Georgia, 579
- Soy-bean Flour, in diet for *Hylemya brassicae*, 489; productivity and development of *Tribolium* spp. in, 503
- Soy-bean Hydrolysates, in diet for *Ceratitis capitata*, 409
- Soy Bean Meal, in rearing medium for *Spodoptera littoralis*, 104
- Soy-bean Oil, in baits for *Pogonomyrmex occidentalis*, 486; in baits for ants, 492
- Soy-bean Protein, in diet for *Anthonomus grandis*, 280
- Soy Bean (Stored), treatment of, against *Lema melanopa*, 641, 642
- Spain, *Liriomyza bryoniae* on tomato in, 112; *Thaumetopoea pityocampa* on pine in, 126; *Paranthrene tabaniformis* on poplar in; *Rhyaciona* spp. on pine in, 127; *Pissodes notatus* on pine in; Lepidoptera injurious to forest nurseries and young plantations in; *Aulonium trisulcum* preying on *Scolytus* spp. on elm in; pines and other conifers damaged by *Myelophilus piniperda* in; *Hylurgus ligniperda* attacking pine in, 128; *Heterographis fulvobasella* on *Halogeton sativus* in, 164; beet attacked by *Lixus* spp. in; agricultural pesticides for plant protection in, 246; Lepidopterous fauna of forests of; *Coraebus undatus* on *Quercus suber* in; *Platypus* spp. in, 255; *Julodis onopordi* attacking *Eucalyptus* in; *Calosoma sycophanta* as predator of *Lymantria dispar* in; Microsporidia parasitising *Lymantria dispar* on oak in; *Lepidosaphes ulmi* on poplar in; *Pectinophora gossypiella* on cotton in, 256; *Anarsia lineatella* in, 333; strawberry viruses transmitted by aphids in; *Pissodes validirostris* attacking pine cones in, 388; *Eupactus solidus* damaging timber in houses in; bacterial strains against *Lymantria dispar* on oak in; egg parasites of *Thaumetopoea pityocampa* on pine in, 389; virus diseases of Lepidopterous defoliators of *Quercus ilex* in, 431; control of *Lymantria dispar* on oak in, 432; pests and diseases of fruit-trees in, 569; hybrids of *Tetranychus telarius-cinnabarinus* complex in, 658
- Spanioza (see *Trioza*)
- Spanogonicus albofasciatus, malathion in sprays against, on cotton in Arizona, 171; as a predator of cotton pests in Arizona, 417
- Sparganothis pilleriana, comparative spray tests with *Bacillus thuringiensis* against, on vines in Germany, 337
- Sparrows (see *Passer domesticus*)
- Spathius fuscipennis, misidentification of, 60
- Spathius helle, parasitising *Chilo suppressalis* in Philippines, misidentification of, 60
- Spatulifimbria castaneiceps, food-plants, distribution and parasites of, 260
- Spectroscopy, Mass, identification of halogenated pesticides by, 404
- Spectrophotofluorometric Method, for determining residues of azinphosmethyl in milk and animal tissues, 419
- Spelt, *Lema melanopa* on, in Indiana, 307
- Sphaeroma terebrans, protection of timber from, in East Africa, 444
- Sphaerophoria cylindrica, preying on *Ostrinia nubilalis* on maize in United States, 275
- Sphaerophoria scripta, predacious on aphids in Poland, 96
- Sphenophorus venatus vestitus, attacking roots of graminaceous plants in Florida, 543-545
- Sphenorynchus abdimii, as predator of *Nomadacris septemfasciata* in Tanganyika, 627
- Sphinx carolina, synonym of *Sphinx sexta*, and type species of *Manduca*, 545
- Sphinx pinastri, parasitised by *Dirhicnus alboannulatus* in Germany, 99
- Sphinx sexta, as synonym of *Sphinx carolina*, 545
- Spiders, predacious on Bruchids, 5; effect on, of predation by birds in oak forest in Germany, 126; as predators on cotton in Arkansas, 179; preying on *Archips crataeganus* on oak in Czechoslovakia, 199; predacious on *Musgraveia sulciventris* in New South Wales and Queensland, 314; as predators of Tipulid larvae, 329; effects of wind-break on aerial density of, in Britain, 335; attacking *Oscinella frit* in Britain, 467; attacking *Ecpantheria icasia* in Costa Rica, 645
- Spilochalcis albifrons, bionomics of, parasitising *Bathyplectes curculionis* in Delaware and New Jersey, 369
- Spilochalcis delumbis, parasitic in *Lema* sp. in Delaware, 368
- Spilonota ocellana, effects of *Bacillus thuringiensis* and captan on, on apple in Wisconsin, 167; damage to sour cherry by, in Wisconsin, 270; infestation of, on insecticide-treated apple in Wisconsin, 279; comparative spray tests with *Bacillus thuringiensis* against, on apple in Germany, 337; integrated control of, on apple in Wisconsin, 360
- Spinach, virus disease of, in California, 71; carbaryl residues on, 186; persistence of dimethoate on, and aphids on, in U.S.A., 363; effect of insecticide treatment of, against *Diabrotica undecimpunctata howardi* in Texas, 414
- Spindle (see *Euonymus europaeus*)
- Spiraea vanhouttei, *Evora hemidesma* on, in Iowa, 410
- Spissistilus festinus, bionomics and rearing of, on lucerne and soy bean, 162
- Spodoptera attacking groundnut in India, 318
- Spodoptera eridania, O,O-diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate against, on beans, 160; carbamate insecticides against, 186; toxicity of Schiff base phenyl N-methylcarbamates to, 188; fractionation and solubilisation of chitin synthetase of, 296; *Smithiavirus pectinophorae* sp.n. not transmitted to, 536
- Spodoptera exempta, evidence on migration of, in East Africa, compared with *Spodoptera trituratora*, 529
- Spodoptera exigua, effects of female sex pheromones on, 61; on beet and cotton in Iran, 519
- Spodoptera frugiperda, diet for, 30; effect of chemosterilants on, 31; predators of, on rice

- in British Guiana, 172; insecticides against, on cotton in Colombia, 211; *Mocis repanda* accompanied by, on maize in Venezuela, 212; control of, on forage crops, 273; insecticides against, on maize in Georgia, 280; DDT against, nuclear polyhedrosis viruses in control of, on sweet maize in Georgia, 361; determination by dissection of parasitism of, in Louisiana, 500; feeding responses of, to plant extracts, 539; packaging machine used in rearing of, 586; use of plant parts as food by, 649
- Spodoptera littoralis*, on lucerne and clover, tests of insecticides against, inorganic compounds ineffective against, 83; artificial method of rearing, 104; insecticides against, on cotton in Egypt, 213; in forests in Spain, misidentified as *Prodenia litura*, 255; relationship between leaf hairiness and resistance to, in cotton in Egypt, 258; on cotton in Egypt, contact and stomach toxicity of insecticides to, 269; combinations of phosphates and carbamates against, in Egypt, 357; toxicity of insecticides to, on cotton in Egypt, 472; effect of insecticides against, on population of spider mites on cotton in Egypt, 474; effects of rearing conditions on, 528;
- Spodoptera litura*, on cauliflower in India, resistance of, to BHC, 86; artificial diet for, 87; attacking groundnut in India, 216; control of, on cotton in Western Australia, 222; *Spodoptera littoralis* misidentified as, 255
- Spodoptera mauritia*, Tachinids parasitic in, in Philippines, 481
- Spodoptera ornithogalli*, review of, in Mexico, 617
- Spodoptera triturrata*, compared with *Spodoptera exempta*, 529
- Spondias mombin*,  $\gamma$ -radiation as quarantine treatment of, 284
- Sprays, comparative effects of, on pests and their natural enemies, 38; equipment for applying, 55; effects of, on aphids and *Coccinella*, 85; assessment of wetting ability of, 113; portable equipment for aerial application of, 161; method for observing pattern of, 180; ground equipment for applying, against *Thrips nigropilosus*, 213; distribution of, applied from aircraft, on cotton, 334; ground equipment for low-volume application of, to maize, 404; application methods for, against cotton pests, 441, 442; comparison of aerial and ground application of, against cotton pests, 474; contamination hazards of, for operator, 474; against *Quadrastipidiotus perniciosus*, 519; tracer dyes for measuring deposits from, in forests, 524; against stored-products pest, 614; evaluation of hand-operated machines for applying, against cotton pests, 625
- Spreader-adhesives, addition of, to insecticide sprays, 243
- Spruce, pests of, in Canada, 20; pests of, in U.S.A., 20; *Hyllobius abietis* on, in Norway and Sweden, 57; *Oligonychus ununguis* on, in Germany, 59; *Hylastes annexens* on, in U.S.A., 67; Lachnids on, in Germany, 99; *Gilpinia* spp. on, in Soviet Union, 140; *Ips* spp. on, in North America, 153; outbreak of *Pachynematus scutellatus* on, in Czechoslovakia, 199; *Ips perturbatus* on, in Canada and U.S.A., 310; *Hylotrupes bajulus* on, 401; *Choristoneura murinana* on, in Czechoslovakia, 430; *Camponotus* ants on, in Germany, 456; spread of *Dendroctonus micans* on roots of, in Soviet Union, 549; natural enemies of *Eucosma tedella* on, in Germany, 564; parasites of *Pristiphora abietina* on, in Germany, 566; effect of osmotic pressure of tree sap of, on development of insects, 576; parasitism of *Choristoneura fumiferana* on, in Maine, 646
- Spruce, Black (see *Picea mariana*)
- Spruce, Blue (see *Picea pungens*)
- Spruce Budworm (see *Choristoneura fumiferana*)
- Spruce, Engelmann (see *Picea engelmanni*)
- Spruce, Red (see *Picea mariana*)
- Spruce, Sitka (see *Picea sitchensis*)
- Spruce, White (see *Picea glauca*)
- Spudaea rutilica*, on *Quercus ilex* in Spain, 255
- Squamura*, bark-feeding species of, 178
- Squash, varietal resistance of, to *Diaphania nitidalis* in Carolina, 31; *Quadrastipidiotus perniciosus* on, in Soviet Union, 322
- Stachys sieboldii* (affinis), *Endothenia quadrimaculana* on, in France, 561
- Staphylinids, as predators of *Hylemya brasicae* in Britain, 335
- Statistics, biological assay and, 297
- Stauffer 2404, in sprays against Coccids, 208
- Stauffer N-2790 (see O-Ethyl S-Phenyl Ethylphosphonodithioate)
- Stearic Acid, gas chromatography of, in *Hypera variabilis*, 413; methyl esters of, inhibiting growth of *Gryllobates sigillatus*, 605
- Stegobium paniceum*, records of, infesting textiles in Germany, 521; damaging stored organic material, 543-545; insecticides against, 622
- Stellaria media*, aphids on, in Britain, 384
- Steneotarsonemus fragariae*, susceptibility of strawberry varieties to, in Poland, 453
- Steneotarsonemus laticeps*, alternative to organochlorine insecticides against, on *Narcissus* in Britain, 386; chemical control of, on forced narcissus in Britain, 470
- Steneotarsonemus pallidus*, on flowers and ornamental plants in Germany, 518; on ornamental plants in U.S.A., 543-545
- Stenocoris apicalis*, identification and distribution of, in Africa, 527
- Stenocoris southwoodi* sp.n., identification and distribution of, 527
- Stenodiplosis bromicola*, larval diapause and seasonal development of, on *Bromus* spp. in Soviet Union, 322; infesting brome grass in Nebraska, 371; damaging *Bromus* spp. in U.S.A., 639
- Stenomalinia muscarum*, attacking *Ceutorhynchus assimilis* on rape in Sweden, susceptibility of, to insecticides in Sweden, 182
- Stenothrips graminum*, measures against on, grasses in Germany, 101; bionomics of, attacking cereal crops in Holland, *Aeolothrips intermedius* as predator of, in Holland 341



- Stereum chailletii*, introduction of, into living trees by *Sirex* and *Urocerus* and causing deterioration of dead balsam fir in Canada, 309
- Stereum sanguinolentum*, causing deterioration of dead balsam fir in Canada, 309
- Sterilization, as alternative method of pest control, 248
- Sternocera aequisignata aurosignata*, control of, infesting shade trees in India, 663
- Sternochetus mangiferae*, bionomics and control of, in mangos in Hawaii, 173
- Stethorus*, as predator of *Panonychus citri* in Formosa, 315
- Stethorus punctillum*, insecticides harmful to, predacious on pests of peach in Ontario, 352
- value of, as predator of *Tetranychus cinnabarinus* in Israel, 558; effect of, of chemicals against *Tetranychus telarius*, 652
- Stethynium*, species of parasitising *Empoasca devastans* in India, 86
- Stictoccephala militaris*, infesting *Liquidambar styraciflua* in Georgia, 540
- Stigmella malella*, control of, on apple in Paris, 228; parasitism of, on apple in Italy, 330
- Stilpnotia salicis*, on poplar and willow in Czechoslovakia, tests of bacteria against, 8; effects of rhythms of light and temperature on diapause in, in Soviet Union, 434; outbreak of, in windbreaks in Austria, bacterial and viral infection in, 521
- Stomacoccus platani*, sprays for control of, on sycamore in California, 486
- Stomopteryx subsecivella*, parasites of, on groundnut in India, 318; bionomics of, on soy bean and groundnut in China, 483
- Stomoxys calcitrans*, use of, in tests and bioassay of insecticides, 28; metabolism of thiotepa in, 39
- Stork (see *Ciconia*, *Leptoptilos*, *Sphenorhynchus*)
- Strategus jugurtha*, control of, on coconut palms in Brazil and on oil palms in Colombia, 577
- Strawberry, pests of, in British Columbia, 18; *Tetranychus telarius* on, in New York, 163; effects of soil applications of DDT and aldrin on, 231; *Tetranychus telarius* on, in Britain, 232; nutrition of, in relation to fecundity of *Sciopithes obscurus* and *Otiorynchus sulcatus* in British Columbia, 268; *Otiorynchus* spp. on, in Bulgaria, 326; *Tetranychus telarius* on, in California, 365; *Capitophorus fragaefolii* and other aphids transmitting virus disease to, in Spain, production of virus-free plants of, 388; *Sciopithes obscurus* and *Nemoctes incomptus* on, in British Columbia; *Trachyphloeus bifoveolatus* on, in British Columbia, 422; varietal susceptibility of, to *Steneotarsonemus fragariae* and *Tetranychus telarius* in Poland, 453; *Lygus lineolaris* on, in New York State, 496; growing points of, attacked by *Cnephasia longana* in Holland, 568; predacious mites of *Tetranychus telarius* on, in California, 579; *Capitophorus fragaefolii* on, in Washington State, 588; *Ancylics comptana* and *Pendemis dumetana* on, in Hungary, 617
- Strepsicrates smithiana*, release and establishment of, against *Myrica* spp. in Hawaii, 174
- Streptomyces griseus*, stored-product insects not developing on, 237; feeding and oviposition of *Cryptolestes ferrugineus* on, 540
- Streptomycin, effects of, on *Dacus oleae*, 411
- Strobane, alone and with DDT, in dusts and sprays against *Anthonomus grandis* and *Heliothis zea*, 355
- Strongwellsea castrans*, infesting *Hylemya cilicrura* in Wisconsin, 371
- Succinic Acid, repellent to *Eurytoma roddi*, 57
- Sucrose, in diets for *Macrosiphum pisum*, 66; and L-proline, 158; inducing feeding response in *Choristoneura fumiferana* on *Picea glauca*, 158; in diet for *Rhagoletis pomonella*, 162; stored *Hypera variabilis* fed on, 169; in diet for *Ips calligraphus*, 209; in diet for *Diatraea saccharalis*, 268; effect of, on reproduction of *Tetranychus telarius*, 353; effect of, on pheromone production in *Ips confusus*, 409; effect of, in diet for Phytoseiid mites, 411; in diet for *Tribolium* spp., 503; feeding on, affecting attractiveness of trimedlure to *Ceratitis capitata*, 636
- Suction Traps, for measuring aerial density of insects and spiders, 335
- Sudan, *Schistocerca gregaria* in, 51; cotton hairiness favouring *Bemisia tabaci* in, 258; treatment of oil-seed cake against *Trogoderma granarium* in, 333; *Empoasca lybica* and *Bemisia tabaci* on hairy varieties of cotton in; *Alcidodes haemopterus* damaging cotton in, 475; tomato leaf and diseases in, 505; distribution on cotton plants of *Empoasca lybica* in, 529; *Schistocerca gregaria* in, 597; effect of *Bemisia tabaci* and *Empoasca lybica* on cotton in, 624; pests of cotton in, 656
- Sugar, in diets for insects, 45; in diet for *Dacus oleae*, 52; in diet for *Hylemya brassicae*, 154; inducing feeding response in *Choristoneura fumiferana* on *Picea glauca*, 158; in baits for pests of vegetable and fruit crops, 399; attractiveness of, with diluted lucerne extract to *Hypera variabilis*, 413; in diet for *Tyrophagus longior* and *Carpoglyphus lactis*, 546; apholate administered to *Dacus oleae* in, 578; no sorption of insecticides through packaging material used for, 582
- Sugar-beet (see Beet)
- Sugar-cane, assessment of losses caused by *Scirpophaga nivella* on, in India, 48; in diets for *Diatraea saccharalis*, 65; *Diatraea saccharalis* on, in Louisiana, 165; damage to by *Diatraea saccharalis* in Colombia, 171; *Diatraea saccharalis* on, in British Guiana, 172; *Diatraea saccharalis* on, in British Guiana, 172; *Dicranoctetes saccharella* on, in Peru, 194; effect of insecticides on yields of, *Diatraea saccharalis* on, in Uruguay, 212; *Isotima javensis* parasitising *Scirpophaga nivella* on, in India, 219; *Xyleborus perforans* on, in Java; *Aleurolobus barodensis* and *Neomaskellia bergii* on, in India, 238; nitrogen content of, affecting fecundity in *Saccharosydne saccharivora* in Jamaica, 289; *Pru-thiana sexnotata* on, in India, 300; pests of, in India, 316; *Oligonychus indicus* and insect-

- ticide residues on, in India, 318; pests of, in Somali, 380; *Polyvinaria saccharia* sp.n., on, in South Africa, 403; *Chilo partellus* on, in India, 440; *Pyrilla perpusilla* on, in India, 478; treatment of setts of, with isobenzan, against pests in India; *Aphis sacchari*, *Aphis indosacchari*, and predators on, in India; *Sesamia inferens* and *Proceras indicus* on, in India; *Pyrilla perpusilla* on, in India, 479; *Tropidocephala* spp. on, in India, 480; *Chilo polychrysa* on, in Malaya, 527; *Diatraeaophaga striatalis* for control of *Proceras sacchariphagus* on, in Réunion and Madagascar, 557; *Trichogramma* parasites of *Proceras sacchariphagus* on, in Madagascar, 630; infested by *Blissus gibbus* in India, 664; *Aleurolobus barodensis* on, in India, 664
- Sulfotep, resistance to, in *Tetranychus telarius*, 515
- Sulfoxide, as synergist with Bidrin, 28; as synergist with pyrethrum, 662
- Sulphur, in sprays or dusts against *Phyllocoptruta oleivora*, 257; against *Tetranychus cinnabarinus*, harmful to beneficial mites, 337; toxicity of mulberry leaves sprayed with, to *Bombyx mori*, 377; detection of, in pesticides by microcoulometric gas chromatography, 404; in sprays against *Tetranychus marianae*, 415; in sprays against *Panonychus ulmi*, effect of, on *Typhlodromus pyri*, 470; in dusts and sprays against Tetranychids, 522; in sprays against spider mites, 651
- Sulphur, Colloidal, in sprays for control of *Cecidophyopsis ribis* and black currant reversion virus, toxicity of, to blackcurrant, 470
- Sumithion (see Fenitrothion)
- Sunflower (see *Helianthus annuus*)
- Sunlight, effect of, on duration of life-cycle of *Hylobius abietis*, 57; methylcarbamate insecticides decomposed by, 186
- Superphosphate, applied with DDT to pasture land, 312; with organochlorine insecticides against *Sitona* spp., 321
- Supona (see Chlorfenvinphos)
- Surinam, absence of red-ring disease in coconut in, 639
- Swaziland, new pests of rice in, 132
- Swede, *Hylemya brassicae* on, in Britain, 80; rearing of *Hylemya brassicae* on, 154; *Hylemya brassicae* on, in Nova Scotia, 157 effects of soil applications of DDT and aldrin on, 231; varietal resistance to insect attack in, in Wisconsin, 275; damage to, by *Nysius huttoni* in New Zealand, 313; adhesives used in seed coating reducing germination in, 344; *Hylemya brassicae* on, on Prince Edward Island, 352; seed treatments of, against *Hylema* spp. in British Columbia, 420; varietal resistance of, to *Phyllotreta striolata* in North Carolina, 524
- Sweden, forest pests in, *Hylobius abietis* on conifers in, 57; *Cydia nigricana* attacking peas in, 181; natural enemies of pests of rape in, 182; *Hylesinus oleiperda* on ash in, 295; *Auchenorrhyncha* and Heteroptera on cereals and grains in, 345; *Coleophora laricella* on larch in, 525; *Hylobius abietis* on conifers in, 563; resistant strain of *Myzus persicae* on beet in, 650
- Sweet Clover (see *Melilotus*)
- Sweet Maize (see Maize, Sweet)
- Sweet Pea (see *Lathyrus odoratus*)
- Sweet Potato, *Psara ipomoealis* on, in southern United States, 209; migration of *Anthonomus grandis* from, to cotton, 271; *Conoderus falli* and *C. vespertinus* in, 274; *Trichoplusia ni* and *Pseudoplusia includens* on, in Alabama, 498
- Sweetgum (see *Liquidambar styraciflua*)
- Swietenia mahagoni*, *Lachnosterna bruneri* on, in Florida, 47
- Switzerland, *Argyresthia trifasciata* on juniper and *Thuja* in, 95; *Anarsia lineatella* and *Cydia molesta* in, 333; outbreak of entomophthoraceous fungi on Syrphids in, 428; bacteria isolated from *Melolontha melolontha*, 430; *Zeiraphera diniana* on larch in, 520; *Hyponomeuta* spp. on plum and apple in, 561; predicting occurrence of *Cydia pomonella* on apple in, 562; control of aphids on potato and sugar-beet in, 577; natural mortality of *Rhagoletis cerasi* infesting cherry in, 617; *Prospaltella perniciosi* controlling *Quadraspidiotus perniciosus* on fruit trees in, 628; method of visual assessment of infestation by arthropod pests of apple in, 628, 629; method for assessing effect of insecticides on fauna of fruit trees in; methods for assessing populations of arthropods on fruit trees in; methods of estimating populations of *Panonychus ulmi* on apple in, 629; *Formica*, spp. in, 655
- Sycamore (see *Platanus racemosa*)
- Sympherobius angustus*, predacious on *Psylla pyricola* in California, 38
- Sympiesis sericeicornis*, parasitic in *Lithocolletis blancardella* in Rumania, 328
- Sympiezomias lewisi*, bionomics of, on *Citrus* in China, 222
- Synergus pacificus*, bionomics of, in British Columbia, 179
- Syngamia haemorrhoidalis*, released against *Lantana camara* in South Africa, 129
- Synharmonia conglobata*, natural enemies of, 104; host-specificity and micro-distribution of, attacking aphids in France, 559
- Synopeas*, parasitising *Dasyneura brassicae* on rape in Sweden, 182
- Syria, *Euzophera osseatella* in, 611
- Syrphus, predacious on *Aphis sacchari* and *Aphis indosacchari* in India, 479
- Syrphus balteatus*, parasitised by *Diplazon trinctus* in Poland, predacious on aphids in Poland, 96
- Syrphus luniger*, laboratory rearing of, on *Aphis fabae* in Germany, 521
- Syrphus ribesii*, predacious on aphids in Poland, 96
- Syrphus torvus*, predacious on aphids in Poland, 96
- Syrphus vitripennis*, predacious on aphids in Poland, 96
- Systasis encyrtoides*, parasitising *Contarinia citri* in Israel, 636



- Systates exaptus*, bionomics of, and measures against on maize, sunn hemp, soy bean and groundnut, in Rhodesia, 74  
*Systox* (see Demeton)  
*Syzygium fruticosum*, parasites of *Orthaga* sp. on, in India, 662

## T

- Tachina larvarum*, *Lixus algirus* parasitised by, in Sicily, 606  
*Taeniothrips cardamomi*, attacking *Amomum subulatum* in India, 440  
*Taeniothrips cyperaceae*, feeding on *Cyperus* spp. in Hawaii, 175  
*Taeniothrips setiventris*, on tea in India, 217  
Taiwan (see Formosa)  
Talc, reducing effectiveness of pyrethrins and piperonyl butoxide, 225; as carrier for bromocyclen dust, 394  
Tallow, in baits for *Pogonomyrmex occidentalis*, 486  
Tamarack (see *Larix laricina*)  
Tanganyika, *Sitophilus oryzae* infesting stored sorghum in, 73; grasshoppers in, 112; breeding of *Nomadacris septemfasciata* in, 234; pests of beans in, 394; *Prosopocera* sp. attacking *Isoberlinia scheffleri* in, Lamiid borers attacking *Parinari excelsa holstii* in, 444; termites attacking crops in, 445; *Glaurocara flava* parasitising *Homorocoryphus nitidulus vicinus* in, 476; migration of *Spodoptera exempta* in, 529; aerial control of *Heliothis armigera* and *Acanthomia horrida* on beans in, 530; assessing adult populations of *Nomadacris septemfasciata* by helicopter in, 531; *Busseola fusca* on maize in, 577; storks and egrets predacious on *Nomadacris septemfasciata* in, 627  
Tangerine,  $\gamma$ -radiation as quarantine treatment of, 284  
*Tanymericus dilaticollis*, adult habits of, on cereals and sugar-beet in Yugoslavia, 6; feeding inhibitors and food preference in, 290  
*Tanymericus indicus*, bionomics of, in India, 214  
*Tanymericus palliatus*, damaging beet in Soviet Union, 194  
*Tapinoma sessile*, destroying other insects in Virginia, 34  
Tar Distillates, against *Enarmonia formosana*, 230; in sprays against Coccids, 328; with parathion, against *Phenacoccus mespili*; in sprays against *Argyresthia ephippella*, 553  
*Taraxacum officinale*, pollen of, not a complete food for flea-beetles, 12; in diet for *Melolontha melolontha*, 107; *Melolontha melolontha* reared on leaves and stems of, in France, 460  
*Tarsonemus*, effect of insecticides and acaricides on, on cotton in Egypt, 474  
*Tarsonemus muehleii* sp.n., on grasses in Germany, 337  
Tasmania, aphid-resistant rape in, 266  
Tawes (see *Puntius javanicus*)  
Taxifolin, not toxic to larvae of *Hylotrupes bajulus*, 405; not affecting larvae of *Hylotrupes bajulus*, 407  
p,p'TDE (see p,p'DDD)  
Tea, attacked by *Nematocerus sulcatus* and *Aperitmetus brunneus* in Kenya, 134; *Tetranychus kanzawai* on, in Japan; *Xylosandrus* spp. reared on sterilized twigs and roots of, 149; *Empoasca paraobliqua* sp.n. on, in Argentina, 180; importance and control of pests of, 185; attack on, by *Taeniothrips setiventris* and *Scirtothrips dorsalis* in India, 217; pests of, in India, 219; *Xyleborus fornicatus* on, in Ceylon, 235; *Spatulifimbria castaneiceps* on, in Ceylon and India, 260; side-effects of dieldrin sprays on; *Cydia leucostoma* on, in India; *Helopeltis theivora* on, in India, 397; *Scirtothrips bispinosus* on, in India, 397, 398; mites on, in India; *Calacarus carinatus* and *Scirtothrips bispinosus* on, in India, 398; *Xyleborus fornicatus* on, in Ceylon, 441, 446; *Andraca bipunctata* on, in China, 482; Tetranychid mites on, in Iran, 519; book with chapter on pests of, 525; *Xylosandrus germanus* on, in Japan, 547; mites on, in India, 663  
Teak, *Endoclitia sericeus* on, in Java, 178  
Technique, modification of n-butyl methacrylate method of imbedding, 344  
Tediton (see Tetradifon)  
Tedion V-18 (see Tetradifon)  
*Tefflus zanzibaricus alluaudi*, introduction and release of, against *Achatina fulica* in Hawaii, 174  
*Tegolophus australis* sp.n. on *Citrus* in New South Wales, 315  
Tegosept M (see Methyl p-Hydroxybenzoate)  
*Telenomus*, introduction and release of, against *Nezara viridula smaragdula* in Hawaii, 173; *Geocoris* eggs parasitised by, 583  
*Telenomus dendrolimusi*, parasitising *Dendrolimus spectabilis* in Korea, 635  
*Telenomus harpyae*, parasitising *Dicranura vinula* in Portugal, 295  
*Telenomus laeviusculus*, parasitism of *Dendrolimus pini* by, in Austria, 562  
*Telenomus mormideae*, attacking *Oebalus poecilus* on rice in British Guiana, 171  
*Telenomus sokolowi*, parasitising eggs of *Eurygaster integriceps* in Soviet Union, 549  
*Telenomus terebrans*, as egg-parasite of *Malacosoma neustria* in Yugoslavia, 392  
*Teleonemia scrupulosa*, released against *Lantana camara* in South Africa, 129  
Telodrin (see Isobenzan)  
Telone, as soil fumigant against *Limoniuss canus*, 366  
Temik (see 2-Methyl-2-(methylthio)propionaldehyde O-(Methylcarbamoyl)oxime)  
*Temnaspidiotus excisus*, on *Aglaonema* in Florida, 543-545  
*Temnochila virescens*, *Thanasimus dubius* attacked by, in Texas, 589  
Temperature, effects of, on Coleoptera, 4; effects of, on larvae of *Hyponomeuta padellus malinellus*, 7; effect of, on the infestation of maize by *Oscinella frit*, 13; effects of, on population and distribution of *Agrotis segetum*, 16; effect of, on fecundity of weevils, 19; effect of, on *Neodiprion swainei*, 21, 24; effect of, on susceptibility of bees to DDT, 40; effect of, on *Pieris brassicae*

- infected with granulosis, 49; effects of, on storage of cereals, 50; effect of, on development of *Murgantia histrionica*, 67; effect of, on *Ptinus tectus*, 76; effect of, on insect infestations in flour mills, 77; effects of, on arthropods in stored products, 78; effect of, on amount of grain consumed by *Sitophilus granarius*, 79; effect of, on hatching and development of *Pseudaletia separata*, 88; effect of, on development of *Leptinotarsa decemlineata*, 89; effect of, on *Hylotrupes bajulus*, 95; effects of, on parasitism of eggs of *Panolis flammea* by *Trichogramma cacoeciae*, 96; effect of, on development of *Agrotis ipsilon*, 101; effect of low degrees of, on last-instar larvae of *Anastatus disparis*, 136; effect of, on *Rhagoletis cerasi*, 138; effect of, in spring on fecundity of *Eurygaster integriceps*; effect of, on population dynamics of *Hypera* spp., 143; effect of, on diapause in *Mamestra brassicae*, 148; effect of, on diapause in *Hylemya brassicae*, 154; suitability of, for infestation of stored grain insects in geographical locations in Canada, 156; effect of, on survival of eggs of *Conoderus vespertinus*, 169; low degrees of, against *Sternonchelus mangiferae* in stored mangos, 173; effects of, on development in resistant and susceptible strains of *Tetranychus telarius*, 181; effects of, on *Eumerus strigatus*, 192; effect of, on *Cleonus punctiventris*, 195; effect of, on activity of *Scapteriscus* spp., 207; effect of, on development of *Coccinella septempunctata*, 214; effect of, on susceptibility of *Trogoderma granarium* to pyrethrins, 218; effect of, on hatching of *Locusta migratoria manilensis*, 221; effect of, on outbreaks of *Pegomya betae*, 224; effect of, on toxicity of insecticides against grain beetles, 225; effect of, on acaricides, 232; effect of, on flight of *Oscinella frit*, 233; effects of, on development of *Nomia melanoderi*, 238; effect of, on radiation susceptibility of *Sitophilus granarius*, 250; effect of, on development of *Latheticus oryzae*, 254; effect of, on sexual maturation of *Chortioetes terminifera*; affecting winter survival of *Chortioetes terminifera*, 266; effect of, on growth of *Aphis fabae*, 291; effects of, on *Peregrinus maidis*, 300; effects of, on *Cinara watsoni*, 303; effects of, on diapause in *Heliothis* spp.; effects of, on diapause in *Protoparce sexta*, 306; effects of, on development of *Lobesia botrana*, 327; effects of, on *Brevicoryne brassicae*, 332; effects of, on water loss in *Iridomyrmex detectus*, 344; effects of, on resistance of lucerne to *Macrosiphum pisum*, 347; effects of, on *Macrosiphum pisum* and on transmission of virus by *Macrosiphum pisum*, 354; effects of, on winter survival of *Pectinophora gossypiella*, 365; effects of, on light reaction of *Meligethes aeneus*, 384; effects of, on *Carpoglyphus lactis*, 387; effects of, on *Aphelinus mali*, 391; effects of, on activity of *Tenebrio molitor*, 403; effects of, on development of *Empoasca fabae*, 412; effects of, on *Rhynacus breittlowi*, 414; effects of, on activity of *Hemerocampa pseudotsugata*, 423; effects of, on *Bacillus thuringiensis*, 430; effects of, on reproduction in *Locusta migratoria*; effects of, on activity of *Schistocerca gregaria*, 433; effects of, on diapause in Lepidoptera; effect of, on *Euproctis chrysorrhoea* and *Lymantria dispar*, 434; effects of, on development of *Pieris napi* and *P. rapae*, 437; effects of, on development of winged forms in *Brevicoryne brassicae*; effects of, on *Rhopalosiphum erysimi pseudo-brassicae*, 438; effects of, on development of *Sitona* spp., 447; effects of, on action of insecticides, 461, 462; effects of, on development of *Acarus siro*, 466; beneath insect emergence traps, 468; effects of, on insecticides and *Cotinis nitida*, 485; effects of, on *Mayetiola destructor*, 487; effects of, on toxicity of insecticides, 493; effects of, on *Dalbulus maidis*, 500; effects of, on flight and egg maturation of *Melolontha* spp., 518; effects of, on development of stored grain insect pests, 523; effects of, on *Coleophora laticella*, 525; effects of, on *Spodoptera littoralis*, 528; effects of, on development of *Contarinia nasturtii*, 529; effects of, on spread of aphid-borne virus diseases of potato, 534; effects of, on mating in *Trichoplusia ni*, 538; effects of, on breeding rate of *Tyrophagus longior* and *Carpoglyphus lactis*, 546; use of, in predicting occurrence of *Cydia pomonella*, 562; effects of, on development of *Hylobius abietis*, 563; effects of, on length of life and colour of progeny of *Macrosiphum avenae*, 567; effect of, on *Ostrinia nubilalis*, 587; effect of, on production of alates by *Brevicoryne brassicae*, 598; effect of, on insect survival in stored grain, 601; effects of, on diapause induction in *Pectinophora gossypiella*, 604; effect of, on diapause in *Coeloides brunneri*, 605; effects of, on development of *Euzophera osseatella*, 611; effects of, on diapause termination in *Aulocara elliotti*, 620; effect of, on diapause of *Gryllus campestris*, 622; effect of, on infestation by *Contarinia medicaginis*, 631; effects of, on diapause of *Athalia glabricollis*, 632; effect of, on toxicity of insecticides, 641, 642; effect of, on reproduction in uniparental race of *Trichogramma semifumatum*, 648; use of, for forecasting hatching of *Adoxophyes orana*, 654
- Tenac, effect of, on insecticides, 263
- Tenebrio molitor*, effect of  $\gamma$ -radiation on, 58; artificial parasitisation by *Lydella grisescens* not successful with, 293; effects of  $\gamma$ -radiation on, in Hungary, 324; locomotory activity of, at different temperatures and light intensities, 403; not able to be infected artificially with *Adelina tribolii*, 427; records of, infesting textiles in Germany, 521, 522
- Tenebroides collaris*, *Thanasimus dubius* attacked by, in Texas, 589
- Tenebroides mauritanicus*, effect of vapour pressure of fumigants on mortality of, in vacuum fumigation, 253
- Tennessee, *Bathyplectes curculionis* in, 168; *Anthonomus grandis* on cotton in, 275; *Cydia toreuta* attacking *Pinus echinata* in, 596
- Tepa, in tests as chemosterilant for *Spodoptera frugiperda*, 31; as analogue of thiotepa, 39;



- as chemosterilant for *Ceratitis capitata*, 51; as chemosterilant for *Dacus oleae*, 52; residues of, on chemosterilised pupae of *Anastrepha ludens*, 274; effect of, on *Trichoplusia ni*, 278; effect of, on *Diabrotica balteata*, 279; as chemosterilant for *Trichoplusia ni*, 283; effects of, as chemosterilant for *Macrosiphum pisum*, 361; effects of, as sterilant for *Popillia japonica*, 364; effects of, on males of *Trichoplusia ni*, 489; tests of, in baits against *Anastrepha ludens*, 499; effects of, on reproduction of *Cydia pomonella*, 583
- Tephromyiella neuquenensis*, bionomics and parasitism of, in grasshoppers in Argentina and Chile, 409
- TEPP, against *Aphis pomi*, 5; against *Macrosiphum pisum*, 82; in sprays against *Tetranychus telarius*, 164; toxicity of, to *Sitophilus oryzae*, 261
- Teredo*, protection of timber from, in East Africa, 444
- Teratophyllidea opaca*, preying on *Selenothrips rubrocinctus* on cacao in Dutch Guiana, 171
- Terminalia*,  $\gamma$ -radiation as quarantine treatment of, 284
- Termites, measures against, in India, 85; in tests of toxicity of insecticides, 86; attacking plastics and rubbers, 240; population studies of, 247; in India, 316; control of, in buildings in Ghana, 334; and trees; recent developments in control of, 344; laboratory testing of preservatives and durability of material against, 406, 407, 408; control of, in forests in Africa, 443; mound-shaving by ant and, in Nigeria, 467, 468; in Africa, 476; tests of isobenzan and other insecticides against, in India, 479; persistence of soil insecticides for control of, in Hawaii, 587
- Terpentol B, against *Hoplocampa* spp., 9
- $\alpha$ -Terpineol, attractant effect of, to *Myelophilus piniperda*, 567
- Terpinyl Acetate, as attractant for *Rhynchophorus palmarum*, 42; combined with trichlorophen in traps for *Ceratitis rosa* and *C. capitata*, attracting males of *Pardalaspis cosyra*, 130
- Tersilochus fulvipes*, effect on, of control measures against rape pests in Germany, parasitising *Ceutorhynchus napi*, 618
- Tersilochus tripartitus obscurator*, effect on, of control measures against rape pests in Germany, parasitising *Ceutorhynchus quadridens*, 618
- 2,4,5,4'-Tetrachlorodiphenyl Sulphide, against *Panonychus ulmi*, 26
- Tetracycline Hydrochloride, in diets for insects, 30
- Tetradifon, against *Panonychus ulmi*, 26; effects of humidity on persistence of, 47; effect of, in sprays on population of *Panonychus ulmi* and *Typhlodromus pyri*, 122; not harmful to beneficial insects, 123; toxicity of, to *Tetranychus cinnabarinus*, 164; in sprays against *Tetranychus telarius*, 230, 232; against *Phyllocoptruta oleivora*, controlling *Panonychus citri*, 257; against *Tetranychus telarius*, 319; and summer oil, in sprays against *Tetranychus cinnabarinus*, 337; against *Tetranychus telarius*, 350; comparison of emulsion and wettable-powder formulations of, against *Tetranychus telarius*, 357; in sprays against *Panonychus ulmi* and *Tetranychus telarius*, 381; effect of, on properties of cotton, 441; and carbaryl, effect of, in combined sprays against cotton worms and spider mites, 474; and dicofol, in sprays against mites on vines, 509; in sprays, resistance to, in *Tetranychus telarius*, 574
- Tetraleurodes hederae*, damaging ivy in Soviet Union, 510
- Tetramethylphosphorodiamidic Fluoride (see Dimefox)
- Tetramethylphosphorodiamidothionic Fluoride (see Thiono-dimefox)
- O,O,O',O'-Tetramethyl O, O'-Thiodi-p-phenylene Phosphorothioate, guide to, 452; in sprays against *Agrotis orthogonia*, 590
- Tetranychus*, chemical control of, on cotton in Uganda, 442; infesting tea in India, on *Indigofera teysmanni* in India, 663
- Tetranychus atlanticus*, on cotton in Iraq, 103
- Tetranychus cinnabarinus*, on cotton in Turkey, oxydemetonmethyl against, 83; hybridisation of mites of complex of, 124; susceptibility to acaricides of, infesting cotton in Egypt, 164; sprays against, in *Citrus* orchards in Lebanon, mites and Coccinellids predacious on, insecticides harmful to predators of, 337; tests of O-methyl O-p-methyl-thiophenyl methylphosphonothioate and related compounds against, on cotton, 357; infesting weeds and orchard trees in Lebanon, 381; value of *Stethorus punctillum* as predator of, on beet in Israel, 558; predacious mites reared on, in Israel, 584; insecticides against, 585; on plants in Poland, 633; hybrids of, 658; on *Indigofera teysmanni* in India, 663
- Tetranychus desertorum*, insecticides against, on cotton in Texas, 279
- Tetranychus dianthicus*, cross-breeding of *T. cinnabarinus* and, 124; effects of sulphur preparations against, on bean in Germany, 522; hybrids of, 658
- Tetranychus kanzawai*, population density of, on tea in Japan, 149
- Tetranychus lombardini*, on *Indigofera teysmanni* in India, 663
- Tetranychus ludeni*, use of DDT correlated with infestation by, 213
- Tetranychus marianae*, susceptibility of *Lycopersicon* spp. to infestation by, in Texas, 31; chemical control of, on tomato and *Solanum melongena* in Texas, 415
- Tetranychus pacificus*, toxicity of carbamoyloxy phosphorodithioates to susceptible and phosphorus-resistant strains of, 282; effect of predacious mites on population of, in vineyards in California, 579
- Tetranychus telarius*, bionomics of, on apple in Chile, 47; toxicity of N-methylenefluoroacetamide derivative to, 114; enzymatic hydrolysis of  $\alpha$ -naphthylacetate by, 117; hybridisation of mites of complex of, 124; on fruit trees in Soviet Union, 142; toxicity of insecticides to, 154; O,O-diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate against, on beans, 160; acaricides against, on straw-

- berry in New York, 163; methods for estimating populations of, on potato in Washington State, 167; bionomics of resistant and susceptible strains of, in Norway, 181; acaricides against, on cucumber in Britain, 230; acaricides against, on strawberry in Britain, 232; *Phytoseiulus persimilis* against, on cucumber in Britain; inbreeding depression in; genetic affinities between adjacent populations of, in Holland, 236; bionomics and control of, on vegetables in Rumania, 247; effect of hydrogen-cyanide fumigations on, in Sicily, 257; resistance to chlorfenson in, on ground cover of apple orchard in Ontario, 266; effect of iron, manganese, zinc, and cobalt on fecundity of, 274; toxicity of carbamates to phosphorus-resistant and susceptible strains of, 282; toxicity of analogues of dichlorvos, trichlorphon and naled to, 283; method for testing acaricide residues against, on rose in Maryland, 287; acquisition of resistance to dicofol by, 293; resistance to, in *Pelargonium*, 296; development of resistance to demeton in, on cotton in Soviet Union, 319; effect of sublethal doses of demeton on survival and fecundity of, on bean plants in Soviet Union, 320; geotactic responses of, in Ontario; control of, on greenhouse cucumbers in Ontario, 350; effects of DDT, sublethal doses of dicofol, plant nitrogen and sugars on reproduction of, 353; tetradifon against, on beans, 357; systemic chemical controlling, on roses in Florida, 358; integrated control of, on apple in Wisconsin, 360; biological control of, on strawberry in California, 365; resistance to thioquinox in, new acaricides against, in Germany, 379; sprays against, on apple in Lebanon, 381; damaging clover in Chile, 408; *Spanogonicus albofasciatus* predacious on, on cotton in Arizona, 417; susceptibility of strawberry varieties to, in Poland, 453; insecticides against, on vines in Rumania, 461; effect of insecticides and acaricides on, on cotton in Egypt, 474; effects of fruit tree treatments on reproduction and mortality of, in Washington State; carbaryl against, toxic to *Typhlodromus* sp., 484; resistance to acaricides and insecticides in, on hops in Poland, 515; on flowers and ornamental plants in Germany, 518; on cotton in Iran, 519; effects of sulphur preparations against, on hops in Germany, 522; mechanism of resistance to insecticides in, 574; development of insecticide resistance in, not prevented by alternative spraying with two unrelated compounds, 574-575; effectiveness of predacious mites against, on strawberry in California, 579; insecticides against, 585; use of, for assay of dimethyl 1-methylcarbamoyl-1-propen-2-yl phosphate, in cotton, 589; DDT applied by hand-operated spraying machines against, on cotton in Uganda, 625; on plants in Poland, 633; susceptibility of apple varieties to, in Michigan; resistance to organophosphorous compounds in, 642; control of, on fruit trees in Italy, 651; control of, on roses in Holland; combined control of mildew and, on cucumber in Holland, 652; hybrids of, 658; insecticides against, on *Solanum melongena* in India, 662; infesting tea in India, 663
- Tetranychus tumidus*, in Florida, 543-545
- Tetranychus viennensis*, distribution of, on fruit trees in Soviet Union, 141
- Tetrapanax papyrifera*, *Pseudaonidia duplex* on, in Florida, 543-545
- Tetrastichus*, species of, parasitising *Nipaeococcus vastator* in India, 86; *Dicranoctetes saccharella* parasitised by, in Peru, 194; as predator of *Cecidophyopsis ribis* on black currant in Britain, 385; parasitic in eggs of *Thaumetopoea pityocampa* in Spain, parasitising *Contarinia sorghicola* in Italy, 389
- Tetrastichus anthophilus*, parasitic in larvae of *Enarmonia ratzeburgiana* in Quebec, 349
- Tetrastichus brontispae*, attempted establishment of, against *Brontispa longissima* in New Caledonia, 560
- Tetrastichus coccinellae*, bionomics of, parasitising Coccinellids in France, 104
- Tetrastichus epilachnae*, *Epilachna chrysomelina* parasitised by, in Sicily, 609
- Tetrastichus rapo*, parasitising *Apanteles rubeola* in British Colombia, 594
- Tetrastichus tibialis*, parasitism by, not affected by dusts against *Thaumetopoea pityocampa* on pine in Spain, 127
- Tetrastichus vaquitarum*, *Dicranoctetes saccharella* parasitised by, in Peru, 194
- Tetrasul, not harmful to beneficial insects, 123; against *Panonychus ulmi* and *Tetranychus telarius*, 652
- Tettigella viridis*, bionomics of, and insecticides against, in Bulgaria, 326
- Texas, *Thanasimus dubius* attacking *Dendroctonus frontalis* in, 589
- Texas, collections of Lepidopterous pests of tomato in, 30; *Tetranychus marianae* on tomato in, 31; *Heliothis* on sesame in, 42; investigations on sex attractant of *Heliothis* in, 45; study of life-cycle of pink bollworm in, 63; insect pests of cotton in, 169; *Epitrix hirtipennis* and *Liriomyza munda* damaging tomato and *Lycopersicum* in, 272; *Anthonomus grandis* on cotton in; control of cotton pests in, 278; *Pityophthorus annectens* on pine in, 303; *Psallus seriatus* on cotton in, 358; *Anthonomus grandis* on cotton in, 359; resistance of cotton strain 1514 to *Heliothis zea* and *Psallus seriatus* in, 362; pests of wheat and sorghum in, 364; *Pectinophora gossypiella* on cotton in, 365; pests of lettuce in, 367; *Heliothis* spp. on cotton in, 369; *Diabrotica undecimpunctata howardi* on spinach, *Trichoplusia ni* and *Brevicoryne brassicae* on cabbage and *Phyllotreta pusilla* on turnips in, 414; control of *Tetranychus marianae* on tomato and egg-plant in, 415; insecticide residues in grain sorghum and Bermuda grass in, 464; *Anthonomus grandis* on cotton in; *Pectinophora gossypiella* and *Heliothis* spp. in okra pods in, 499; *Toxoptera graminum* on wheat in, 541; *Heliothis* spp. and other insects on glanded and glandless strains of cotton in, 581; *Dendroctonus frontalis* preyed on by *Thanasimus dubius* in; control of cotton pests in, 589; control of



- Frankliniella* sp. and *Psallus seriatus* on cotton in, 591; *Ceratitis capitata* in, 643; *Ollarianus strictus* and *Lymantria marylandicus* reared from *Citrus* in, 648
- Textile fabrics, damage to, by *Periplaneta americana* and *Acheta domesticus*, 125; pests of, in Germany, 521, 522
- Textiles (see also Woollen Fabrics)
- Thailand, host list of insects of, 344; *Oryzaephilus surinamensis* in, 601
- Thanasimus*, abundance of, in relation to *Myelophilus piniperda* in Finland, 383
- Thanasimus dubius*, *Dendroctonus frontalis* preyed on by, in North Carolina, 542; attacked by *Temnochila virescens* and *Tenebroides collaris*, as predator of *Dendroctonus frontalis* in Texas, 589
- Thanite, toxicity of, to *Coccinella septempunctata*, 85
- Thaumetopoea pityocampa*, on pine in France, 121; control campaign against, on pine in Spain; natural enemies of, 126; parasites of, on pine in Portugal, 295; recorded from Israel, morphological variations in, in Mediterranean basin, 388; egg parasites of, on pine in Spain, 389; occurrence of bacterial infection in intestine of larvae of, on pine in France, 432
- Thaumetopoea wilkinsoni*, toxicity of analogues of dichlorvos, trichlorphon and naled to, 283; in Israel, 388
- Thecodiplosis brachyntera*, bionomics and control of, on pine in Germany, 659
- Thelyconychia vidua*, as parasite of *Leptozygaena gracilis* on banana in Fiji, 177
- Theobroma cacao* (see Cacao)
- Therioaphis*, revision of genus of, with descriptions of new species, 308
- Therioaphis brachytricha*, on *Lotus* in Europe, 308
- Therioaphis luteola*, on *Trifolium pratense*, 308
- Therioaphis riehmii*, infesting *Melilotus* spp., 308
- Therioaphis subalba*, on *Trifolium medium*, 308
- Therioaphis trifolii*, on lucerne in Poland, 139; on leguminous plants, 308; evaluation of lucerne for resistance to, in Kansas, 366; resistance to, in lucerne strains in Nebraska, 416; holocyclic strain of, on lucerne in U.S.A., 493
- Therioaphis trifolii brevipilosa* subsp.n., on *Astragalus monspessulanus*, 308
- Thermobia domestica*, finding of, in Norway, 237
- Therionia atalantae*, parasitising *Archips crataeganus* on oak in Soviet Union, 142
- Thevetia peruviana*, *Palpita flegia* on, in Florida, 543-545
- Thiamine, attractive to *Eurytoma roddi*, 57
- Thimet (see Phorate)
- Thin-layer Chromatography, use of, in determining effects of sunlight and ultra-violet light on methylcarbamate insecticides, 186
- Thiocron (see O,O-Dimethyl S-2-Methoxyethylcarbamoylmethyl Phosphorodithioate)
- Thiometon, against *Hoplocampa* spp., 9; effects of, on bees, 10; persistence of deposits of, after spraying against *Trioxa apicalis*, 137; toxicity of, to *Tetranychus cinnabarinus*, 164; in sprays against *Typhlocyba rosae*, 197; in sprays against *Pectinophora gossypiella*; in sprays against cotton pests, 215; effect of, on virus-like proliferation of lucerne caused by *Aceria medicaginis*, 223; and endrin, in spray against *Alabama argillacea*, 243; against *Phyllocoptruta oleivora*, 257; phytotoxicity of, to seeds and plants, 263; resistance to, in *Panonychus ulmi*, 325; against aphids on *Prunus mahaleb*, 327; in sprays against *Scirtothrips bispinosus*, 397, 398; in sprays against *Bryobia praetiosa*, 453; in sprays against *Dasyneura pyri*, 515; in sprays against *Aphis fabae*, 516; and carbamates, against *Drosophila melanogaster*, 599; in aerosols and sprays against *Adelges nordmannianae*, 632; resistance to, in *Myzus persicae*, 650
- Thionazin, ineffective against *Hylemya brassicae*, 36; against *Hylemya brassicae*; against aphids; effects of, on soil fauna; against wireworms; persistence of, in soil, 80; as side-dressings, against *Myzus persicae*, 355; in drenches, granules and seed treatment with, against *Hylemya antiqua*, 356; against resistant strains of *Hylemya brassicae*, 420; in granules against resistant strains of *Hylemya brassicae*; toxicity of, to seedlings; in granules against resistant *Psila rosae*; toxicity of, to emergent seedlings, 421; labelled with <sup>14</sup>C, persistence of, in soils, 485; in sprays against *Agrotis orthogonia*, 590; resistance to, in *Myzus persicae*, 650
- Thiono-DFP (see Diisopropyl Phosphorofluoridithionate)
- Thiono-dimefox, toxicity of, to insects and mice, 188
- Thiono-mipafox, toxicity of, to insects and mice, 188
- Thioquinox, in sprays against *Tetranychus telarius*, phytotoxicity of, on plants, 230; guide to, 297; alone and with Volck summer oil or chlorobenzilate, against *Tetranychus cinnabarinus*, 337; development of resistance to, in Tetranychids, 379; in sprays against *Panonychus ulmi* and *Tetranychus telarius*, 381; effect of, in combined sprays against cotton worms and spider mites, 474; against *Psylla pyricola*, 643; in sprays against spider mites, 651; in sprays against *Tetranychus telarius* and cucumber mildew; toxicity of, to *Phytoseiulus persimilis*, *Stethorus punctillum* not harmed by, 652
- Thiotepa, labelled with <sup>32</sup>P, tepa as analogue of, metabolism of, in mammals and insects, 39
- 2-Thiouracil, effects of, on reproduction of *Myzus persicae*, 496
- Thiram, seed treatments with mixtures of insecticides and, 43; in sprays against *Venturia inaequalis* not harming beneficial mites and insects; and other fungicides, 122; not affecting *Panonychus ulmi*, 157; and  $\gamma$  BHC, seed treatment with, against *Atomaria linearis*, 516; alone and with heptachlor, seed treatments with, in dust against *Sitona* spp., 550
- Thistle (see *Cirsium arvense*)
- Thomasiniana ribis*, bionomics of, on black currant in Poland, 512

- Thomasiina theobaldi*, bionomics and control of, on raspberry in Holland, 382
- Thoroclear 777, effect of, on effectiveness of deposits of insecticides, 353
- Thosea aperiens*, first record of, in India, 663
- Thrips, on cotton in Alabama, 165, 166; control of, on cotton in North Carolina, 272; control of, on crops in Italy, 390; repopulation of, in areas previously treated with insecticides against *Popillia japonica* in Illinois, 497; on maize in Soviet Union, 633
- Thrips angusticeps*, measures against, on grasses in Germany, 101; bionomics of, attacking cereal crops in Holland, 341
- Thrips nigropilosus*, sprays against, on *Chrysanthemum cinerariaefolium* in Kenya, 213
- Thrips tabaci*, measures against on grasses in Germany, 101; infestation of cotton by, in Alabama, 165; methods for estimating populations of, on potato in Washington State, 167; on cotton in Iran, 519; control of, on bulbs in propagating rooms in Holland, 568; control of, on pea in Iraq, 584; sprays against, on onion in California, 590
- Thuja*, damaged by *Phloeosinus thujae* in Holland, 178
- Thuja occidentalis*, *Argyresthia trifasciata* on, in Switzerland, 95; species from, identified as *Eulecanium fletcheri* in Ontario, 203
- Thuja plicata*, *Argyresthia trifasciata* on, in Switzerland, 95
- $\beta$ -Thujaplicin, toxicity of, to larvae of *Hylotrupes bajulus*, 405, 407
- Thuricide against *Evagora milleri*, 42; tests with, against *Earias insulana*, 102; against *Cheimophila salicella*, 267; against Noctuids and aphids, 367; against *Pristiphora*, 429; against Lepidoptera, 430; against *Lymantria dispar*, 491; against *Galleria mellonella*, 566; against *Neodiprion taedae*, 643
- Thyodrias contractus*, as fabric pest in Canada, 571
- Thymelicus lineola*, oviposition sites and viability of eggs of, on grasses in Ontario, 350
- Thyridopteryx ephemeraeformis*, natural enemies of; on *Robinia pseudacacia* in Virginia and *Pinus strobus* in Carolina, 29
- Thysanus*, species of, parasitising *Nipaeococcus vastator* in India, 86
- Thysanus ater*, parasitising *Quadraspidiotus perniciosus* in Germany, 102
- Tibet, *Locusta migratoria tibetensis* in, 115
- Tibraca limbativentris*, on rice in British Guiana, 171
- Til (see *Sesamum orientale*)
- Tilapia mossambica*, toxicity of  $\gamma$ -BHC to, 494
- Tile, persistence of insecticide deposits on, 622
- Tilia platyphyllos*, flowering of, in relation to *Hyponomeuta padellus malinellus*, 97, 98
- Timber (see Building Timber and Furniture)
- Timber, persistence of insecticides in; treatments of, 54; Siricids infesting, 68; attacked by *Reticulitermes flavipes* in Ontario, 204; attacked by *Coptotermes formosanus* in Texas, 211; damaged by *Heterotermes indicola* in India, 216; termites attacking, in Italy, 329; injurious insects on, 403; attractiveness to termites of substance found in, attacked by Basidiomycetes, 406; laboratory tests on natural resistance of, to termites, 406, 407; efficacy of wood preservatives against fungi and insects in; components of, in relation to development of *Hylotrupes bajulus*, 407; comparative test of water-soluble wood preservatives against termites in, 408; treatment of, against *Oemida gahani*; protection of, from marine borer damage in East Africa, 444; treatment of, against timber beetles in Germany, 456; feeding zones of *Hylotrupes bajulus* in, 520; protection of, in storage, against insect borers and subterranean termites, 615; persistence of insecticide deposits on, 622; treatment of, with V.H.F. radio waves against wood-boring insects, 623
- Timothy (see *Phleum pratense*)
- Tineola bisselliella*, moth-proofing agents protecting woollen fabrics from, 125; moth-proofing of wool against, 185; method of testing moth-proofing treatments against, 240; records of, infesting textiles in Germany, 521; as fabric pests in Canada, 571
- Tinea pellionella*, mothproofing of wool against, 185; records of, infesting textiles in Germany, 521; as fabric pests in Canada, 571
- Tiofenit (see Parathion)
- Tiofos (see Parathion)
- Tiphia vernalis*, effect of low host density on, in New Jersey and Pennsylvania, 369
- Tipula Iridescent Virus*, insect host range of, 431
- Tipula oleracea*, control measures for, injurious to agriculture in Italy, 329
- Tipula paludosa*, control measures for, injurious to agriculture in Italy, 329; low rainfall affecting populations of, in Britain, 467
- Tipula venturii*, control measures for, injurious to agriculture in Italy, 329
- Tipulidae, machine for separating larvae of, from turf samples, 240
- Tipulid Larvae, bionomics of, Tachinids parasitic in, predators of, control measures for, injurious to agriculture in Italy, 329
- Tiracola plagiata*, attacking rubber trees in Territory of Papua and New Guinea, 480
- Tits (see *Parus*)
- TMTD (see Thiram)
- Toadflax (see *Linaria canadensis*)
- Tobacco, *Agrotis segetum* on, in Soviet Union, 16; *Hylemya trichodactyla* on, in Ontario, 43; *Myzus persicae* on, in Kentucky, 166; C<sup>14</sup>-DDD inhaled with smoke from, 187; *Scapteriscus acletus* and *S. vicinus* on, in Florida, 207; migration of *Anthonomus grandis* from, to cotton, 271; *Conoderus* spp. on, 274; *Myzus persicae* and viruses in, in Rhodesia, 334; systemic insecticide for control of *Myzus persicae* on, in Maryland, 355; survival of *Heliothis zea* and *Heliothis virescens* on, in Kentucky, 413; *Phthorimaea operculella* on, in Queensland, 449; *Bemisia* sp. transmitting leaf curl disease of, in Philippines, 480; transmission of tomato virus disease to, cotton virus not transmitted to, 505; traps for *Manduca sexta* on, in North Carolina, 580; *Heliothis* spp. on, in Mississippi, 581; development of *Heliothis zea* and *Spodoptera frugiperda* on, 649



- Tobacco (Stored), automatic dichlorvos aerosol treatment against *Lasioderma serricorne* in, in Virginia, 354; insecticide treatment of, against *Ephestia elutella* in U.S.A., 355; treatment of, damaged by insects and mites in Turkey, 614
- Toluene- $\alpha$ ,  $\alpha$ -dithiol Bis(O,O-dimethyl phosphorodithioate), against *Hypera variabilis*, 497
- Tomato, susceptibility of, to infestation by *Tetranychus marianae* in Texas, 31; Eriophyids on, in Rhodesia, 71; *Liriomyza bryoniae* on, in England and in Spain, 112; *Liriomyza munda* on, in Florida, 208; effects of soil applications of DDT and aldrin on, 231; dimethyl 1-dimethylcarbamoyl-1-propen-2-yl phosphate residues in, 240; varietal susceptibility of, to *Epitrix hirtipennis* and *Liriomyza munda* in Texas, 272;  $\gamma$ -radiation as quarantine treatment of, 284; *Liriomyza* sp. on, in Florida, 356; *Gnorimoschema absoluta* on, in Chile, 377; effect of insecticide treatment on, against *Tetranychus marianae* in Texas, 415; insecticide residues on, 461; *Trichoplusia ni* and *Pseudoplusia includens* on, in Alabama, 498; viruses of, associated with virus disease in tobacco and *Datura stramonium*, cotton virus not transmitted to, 505; *Leptinotarsa decemlineata* on, 575; *Euzophera osseata* on, in Israel, Egypt, and other Mediterranean countries, 611; development of *Heliothis zea* and *Spodoptera frugiperda* on, 649
- Tomicobia tibialis*, bionomics of, parasitising *Ips confusus* on pine in California, 206
- Tortricodes tortricella*, effect of predation by birds on, in oak forest in Germany, 126
- Tortrix*, damaging clover in Chile, 408
- Tortrix viridana*, parasites of, on oak in Europe, 123; effect on, of predation by birds in oak forest in Germany, 126; parasites of, on oak in Portugal, 295; investigations on parasites of, 426; birds against, on oak in Germany, 523; host-seeking by parasites of, 567
- Toumeyella pinicola*, insecticides against, on *Pinus radiata* in California; parasitised by *Coccophagus lycimnia*, 164
- Toxaphene, alone and with DDT, effects of, on bees, 40; toxicity of, to *Spodoptera littoralis*, 84; against *Tychius flavus*, 91; destroying natural enemies of *Tetranychus cinnabarinus*, 164; and DDT, in sprays against cotton pests, 166; against *Elasmopalpus lignosellus*, 206; and DDT, in sprays against cotton bollworms, 211; in sprays and dusts against *Mocis repanda*, 212; in sprays against *Spodoptera littoralis*, 213; and DDT, in dusts against *Amsacta moorei*, 214; toxicity of, to *Heterotermes indicola*, 216; toxicity of, to *Tribolium castaneum* and *Sitophilus oryzae*, 217; soil treatment with, in dusts against *Cyrtomenus mirabilis*, 242; in dusts against *Oxycaenus hyalinipennis*, 243; trunk treatment with, in sprays against *Coraebus undatus*; ineffective in sprays against *Coraebus undatus*, 255; toxicity of, to *Sitophilus oryzae*; toxicity of, to *Tribolium castaneum*, 261; contact versus stomach toxicity of, to *Spodoptera littoralis*, 269; in sprays against *Anthonomus grandis*, 272; in sprays against cotton pests, 278; toxicity of, to adults and larvae of *Dacus cucurbitae*, 316; alone and with DDT, in dusts and sprays, against *Anthonomus grandis* and *Heliothis zea*, 355; and DDT, in sprays against *Psallus seriatus*, 358; alone or with DDT, susceptibility of *Heliothis zea* to, 369; in sprays against *Odontothrips confusus*, 390; effectiveness of, in stored pine sapwood against termites, 408; soil treatments with, tolerance of *Nemocestes incomptus* to, 422; effect of, on properties of cotton, 441; effect of, against cotton pests, on crop yields, 442; factors affecting efficiency of, in soil or seed treatments against crop pests, 461; examination of, by gas chromatography; gas-chromatographic measurement of, in milk, fat, blood, and lucerne hay, 464; and parathion, toxicity of, to *Spodoptera littoralis*; alone or with DDT, effect of, on maize yields, in sprays and granules against maize borers, 472; toxicity of, to *Eyprepocnemis plorans*, 473; effect of, in sprays against cotton worms, on populations of spider mites, 474; in sprays against *Dasyneura pyri*, 515; tests of, against *Phthorimaea operculella*, 613; in dusts against *Dysdercus* spp., 624
- Toxoptera aurantii*, on *Citrus* in Italy, 103; control of, on *Citrus* in Venezuela, 301; on *Citrus* in Somalia, 380; not transmitting *Citrus tristeza virus* in Israel, 636
- Toxoptera citricida*, transmitting viruses of the *Citrus tristeza* complex, 60; on *Citrus* in India, 84; transmitting yellow-shoot virus of *Citrus* in China, 263; seasonal changes in attractiveness of yellow to, in South Africa, 338; *Citrus* virus in relation to, in South Africa, 396
- Toxoptera cyperi*, feeding on *Cyperus rotundus* in Hawaii, 175
- Toxoptera graminum*, on ornamental plants in Manitoba, parasite of, 24; not carried by *Lasius niger*, 292; development and reproduction of, on barley in Manitoba, 311; resistance of wheat to, in Kansas, 496; effect of feeding by, on roots of wheat in Texas, 541
- Trachyphloeus bifoveolatus*, sprays against, attacking strawberry in British Columbia, 422
- Tranzschelia pruni-spinosae*, control of leaf rust caused by, on peach in Brazil, 243
- Trapa bispinosa*, *Galerucella birmanica* on, in India, 440
- Traps, effects of static electricity on captures in, 22; for *Rhagoletis pomonella*, 24; for *Lygus hesperus*; for *Dacus dorsalis*, 37; for *Ceratitis capitata*, 53; for *Hypera variabilis*, 63; for *Mycodiplosis alternata*, 69; for Thysanoptera, 79; for *Dacus* spp., 214; ultraviolet light in, 265, 295; against *Oryctes rhinoceros*, 313; for *Ceratitis capitata*, 376; use of scents for attracting insects to, 399; temperature beneath, for study of emergence of insects, 468; for *Hylobius pales* and *Pachylobius piciporus*, 542; modifications of Malaise design of, 542, 543; for millepedes, 577; for

- Pectinophora gossypiella*; for aphids, 589; for *Heliothis* spp., 596; use of, for assessing populations of injurious insects in orchards, 629 (see also Adhesive Traps, Light Traps, Log Traps, Suction Traps, and Baits)
- Treatia dysderci*, *Entomoseius* gen. n. erected for, on *Dysdercus howardi* in Trinidad, 205
- Trechnites insidiosus*, parasitising *Psylla pyricola* in California, 38
- Trees, Deciduous, attack on, by Anobiids in Poland, 324
- Trefoil Bird's-foot (see *Lotus corniculatus*)
- Tremex columba*, fungus on hypopleural organs of female larva of, in New Brunswick, 402
- Trialeurodes abutilonea*, parasitised by *Encarsia lutea* on cotton and sunflower in Arizona, 168; Hymenopterous parasites in, predators and fungi associated with, in Illinois, 304; *Spanogonicus albofasciatus* predacious on, on cotton in Arizona, 417
- Trialeurodes floridensis*, infestation and control of, on avocado in Florida, 416
- Trialeurodes lauri*, bionomics and control of, on ornamental plants in Soviet Union, 510
- Trialeurodes vaporariorum*, as vector of plant viruses, 71; O,O-diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate against, on nasturtium, 160; parasitised by *Encarsia lutea* on cotton and sunflower in Arizona, 168; *Encarsia formosa* in, in California, 306; in Soviet Union, 510
- Triamphos, chemical definition of, 2; in sprays against *Podosphaera leucotricha* not affecting population of *Typhlodromus pyri*; in sprays against *Podosphaera leucotricha* harmless to beneficial mites and insects, 122
- Tribolium castaneum*, determination of resistance of, to malathion, 3; effects of gaseous tensions on mortality of adults of, factors affecting development of, 4; reared on wheat flour, effects of calcium orthophosphate on, 50; in tests of insecticides, 54; diet for, 78; competition between *Tribolium confusum* and, 79; in tests of toxicity of insecticides, 86; on stored ground-nuts in Nigeria, 110; bioassay of pyrethrum with; toxicity of compounds of pyrethrum, to, 113; varietal susceptibility of maize to, in India, 115; infesting stored dates in Israel, 143; effect of particle size of grain on control of, by malathion, 146; attacking stored rice in British Guiana, 172; genetic strains and competition in populations of, reared with *T. confusum*, 183; control of, in stored rice and wheat flour in India, 215; comparative toxicity of insecticides to, 217; toxicity of synergised pyrethrum to, susceptibility of, to insecticides, 225; susceptibility of, to  $\gamma$ -radiation, 251, 252; organo-phosphorus insecticides against, 254; susceptibility of, to insecticides, 261; varietal resistance or susceptibility of sorghum to, in India, 295; factors affecting development rate of, in wheat flour, 336; vitamin B requirements of larvae of, 343; development and mortality of, on seed-borne fungi, 344; dust treatment against, in stored maize in Kenya, 394; fumigation against, in bagged wheat in India; infesting processed food bari in storage in India, 399; larvae of, infected artificially with *Adelina tribolii*, 427; effect of irradiation on susceptibility of, to *Bacillus thuringiensis*, 431; not associated with hot spots in stored wheat, 489; productivity and development rates of, on different diets, 503; records of, infesting textiles in Germany, 521; attacking stored sunflower seeds in Yugoslavia; effect of medium on population density of, 602; migration tendency of two strains of, 603; insecticides against, 622; association of, with storage fungi, 623
- Tribolium confusum*, effect of  $\gamma$ -radiation on, 58; diet for, 78; competition between *Tribolium castaneum* and, 79; O,O-Diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate against, in stored wheat, 160; genetic strains and competition in populations of, reared with *Tribolium castaneum*, 183; effect of rearing medium on susceptibility of, to  $\gamma$ -radiation, 251; susceptibility of, to  $\gamma$ -radiation, 251, 252; effect of dose rate on response of, to  $\gamma$ -radiation; effect of vapour pressure of fumigants on mortality of, in vacuum fumigation, 253; organophosphorus insecticides against, 254; silica gel protecting packaged food from, 277; effects of  $\gamma$ -radiation on, in Hungary, 324; factors affecting development rate of, in wheat flour, 336; development and mortality of, on seed-borne fungi; effects of moisture on chorion of eggs of, 344; tests with Bromocyclen as protectant for stored wheat against, in Georgia, 364; respiration measurement of, by gas chromatography, 404; morphology and sexual behaviour of, 417; larvae of, infected artificially with *Adelina tribolii*, 427; effect of irradiation on susceptibility of, to *Bacillus thuringiensis*, 431; toxicity of fumigants to, 488; productivity and development rates of, on different diets, 503; tests of chlorbicyclen and DDT against, in Poland, 513; comparative effectiveness of fumigants against, in wheat in Kansas, 542; effect of  $\gamma$ -radiation on length of life of, 578; fumigation of, during induced elevation or depression of respiration, 584; effect of medium on population density of, 602; effect of 5-nitro-2-furaldehyde-2-(2-hydroxyethyl)semicarbazone on, 616
- Tribolium destructor*, larvae of, infected artificially with *Adelina tribolii*, 427
- Tribulus terrestris*, parasitism of *Microlarinus* spp. on, 170
- S,S,S-Tributyl Phosphorotrithioate, treatment of cotton with, against overwintering population of *Anthonomus grandis*, 580
- Trichiocampus irregularis*, effects of virus on habits of, 50; transovarian transmission of *Borrelnavirus* in, 431
- Trichiocampus viminalis*, effects of virus on habits of, 50; transovarian transmission of *Borrelnavirus* in, 431
- 2,4,5-Trichlorophenyl Ethylphosphoramidate, synthesis and insecticidal activity of, 188
- Trichlorphon, effects of, on bioassay of Bidrin, 28; toxicity of, to *Coccinella septempunctata*, 85; against *Aegeria myopaeformis*, 90; against *Ostrinia nubilalis*, 91; in sprays



- against *Panonychus ulmi* not harmful to predacious mites, 122; in baits against *Ceratitis rosa* and *C. capitata*, 130; in sprays against *Icerya purchasi*, 135; in sprays against *Eurygaster integriceps*, 144; in sprays and in fertiliser mixtures against *Hylemya brassicae*, 157; in sprays against *Myzus persicae*, 166; in sprays against *Pegomya betae*, 194; against *Enarmonia formosana*; against *Lobesia botrana*, 195; against *Liriomyza munda*, surface-active agents added to sprays of, 208; against *Ectomyelois ceratoniae*, 211; in sprays and dusts against *Mocis repanda*; applied by aircraft in granules against *Diatraea saccharalis*, 212; in sprays against *Spodoptera littoralis*, 213; in sprays against *Nausinoe geometralis*, 221; in sprays against *Spodoptera litura*, phytotoxicity of, 222; in sprays against *Zeuzera pyrina*, 228; in sprays against *Enarmonia formosana*, 230; in sprays against *Plutella maculipennis*, 231; and DDT against *Agrotis ipsilon* and *A. segetum*, 264; in sprays against *Nola distributa*, 265; in sprays and granules against *Pediasia* spp.; contact versus stomach toxicity of, to *Spodoptera littoralis*, 269; in sprays against *Lygus hesperus* and *Frankliniella occidentalis*, 276; toxicity of, to agricultural insects, analogues of, 283; mouse toxicity and anticholinesterase activity of, to *Ceratitis capitata*, analogues of, 292; toxicity of, to adults of *Dacus cucurbitae*, 316; in sprays, against *Psallus seriatus*, 358; tests of, in sprays against aphids, 386; effective in sprays against *Aporia crataegi*, 439; with DDT, effect of, against cotton pests, on crop yields, 442; effectiveness of, against *Cydia funebrana*, 452; in sprays against *Bryobia praetiosa*, 453; toxicity of, to *Spodoptera littoralis*; effects of, on maize yields, in sprays and granules against maize borers, 472; and fenthion with carbaryl, effect of, in sprays against cotton worms, on populations of spider mites, 474; against *Athalia rosae ruficornis*, 483; in sprays and granules against *Oxycaenus* spp., 484; in sprays against *Lymantria dispar*, 491; soil treatment with and in sprays against *Hylemya* spp., 511; in sprays against *Rhagoletis cerasi*, 514; against *Chilo polychrysa*, 527; in sprays against *Sitona* spp., 550; in sprays against *Pegomya betae*, 551; soil treatment with, against *Hylemya* spp., and effect of, on cabbage, 552; in sprays against *Argyresthia ephippella*, 553; as wettable powders against *Hypera variabilis*, 570; in sprays against *Agrotis orthogonia*, 590; and Isolan, against *Drosophila melanogaster*, 599; in sprays against *Ceratitis capitata*, 613; tests of, against *Phthorimaea operculella*, 613; persistence of deposits of, used in sprays against stored-product beetles, 622; in aerosols and sprays against *Adelges nordmannianae*, 632; against *Leptinotarsa decemlineata*, 635; in dusts against *Phyrdenus muriceus*, 639
- Trichogramma*, parasitism by, not affected by dusts against *Thaumetopoea pityocampa* on pine in Spain, 127; eggs of *Mamestra brassicae* parasitised by, in Japan, 148; combined use of *Bacillus thuringiensis* and, against cabbage pests, 432; use of, in control of rice stem borers, 481; parasitising *Eucosma tedella* in Germany, 564
- Trichogramma austriaticum*, use of, in control of rice stem-borers in Philippines, 481; bionomics and rearing of, on *Corcyra cephalonica* in Madagascar, parasitic in eggs of *Proceras sacchariphagus*, 558; crossed with *Trichogramma fasciatum*, parasitising *Proceras sacchariphagus* on sugar-cane in Madagascar, 630
- Trichogramma cacociae*, as egg parasite of *Panolis flammea* in Poland, 96; parasitising *Archips crataegus* on oak in Soviet Union, 142; effect of insecticide dusts on parasitism by, in *Bupalus piniarius* in Soviet Union, 189; parasitising eggs of *Archips crataegus* on oak in Czechoslovakia, 199; wing size and flight activity of, 344; effect of *Bacillus thuringiensis galleriae* and BHC on, parasitic in eggs of *Sitotroga cerealella*, 432; comparison of insecticides and, against *Cydia funebrana* in Poland, 454; effectiveness of, for control of *Cydia funebrana* in Poland, 559; bionomics, ecology and use of, in plant protection in Poland, 603
- Trichogramma dendrolimi*, laboratory rearing of, for use in biological control, parasitising *Dendrolimus spectabilis*, 635
- Trichogramma embryophagum*, bionomics, ecology and use of, in plant protection in Poland, 603; egg parasitism of *Panolis flammea* by, in Germany, 659
- Trichogramma evanescens*, *Archips rosanus* parasitised by, in Soviet Union, 192; parasitic in eggs of *Thaumetopoea pityocampa* in Spain, 389; bionomics, ecology and use of, in plant protection in Poland, 603
- Trichogramma fasciatum*, eggs of *Mamestra brassicae* parasitised by, in Japan, 148; crossed with *Trichogramma austriaticum*, reared on *Corcyra cephalonica*, released against *Proceras sacchariphages* on sugar-cane in Madagascar, 630
- Trichogramma japonicum*, use of, in control of rice stem-borers in Philippines, 481
- Trichogramma luteum*, parasitising eggs of *Earias biplaga* in Nigeria, 626
- Trichogramma minutum*, rearing of *Corcyra cephalonica* for mass production of, 144; parasitising *Bactra truculenta* on nutgrass in Hawaii, 175; parasitic in eggs of *Enarmonia ratzeburgiana* in Quebec, 349; attacking *Porphyrosela minuta* in Chile, 377; use of, in control of rice stem-borers in Philippines, 481; parasitising eggs of *Rhyacionia* spp., in Georgia, 590; parasitism by, during outbreak of *Choristoneura fumiferana* in Maine, 646
- Trichogramma pretiosum*, parasitising eggs of *Heliothis zea* on maize in California, 582
- Trichogramma semblidis*, wing size and flight activity of, 344
- Trichogramma semifumatum*, effect of temperature on production of males and sexual mosaics in uniparental race of, in California, 648

- Trichomalus perfectus*, attacking *Ceutorhynchus assimilis* on rape in Sweden, 182
- Trichophaga tapetzella*, as fabric pest in Canada, 571
- Trichoplusia ni*, diet for, 29; light-trap catches of, on cotton in Texas, 31; effects of female sex pheromones on, 61; on cabbage in Wisconsin; varietal susceptibility of cabbage to, 66, 67; *Encarsia lutea* parasitising eggs of, on cotton in Arizona, 168; varietal resistance in crucifers to, in Wisconsin, 275; effects of chemosterilants on, 278; sterile male releases and chemosterilant method for control of, on cabbage in California, 283; tests of dusts for control of, on lettuce in Texas, 367; granular systemic insecticides against, on cabbage in Texas, 414; effects of tepa on males of, 489; sex attractant increasing attraction of, to ultraviolet light in California, 492; on field crops in Alabama, 498; *Smithiavirus pectinophorae*, transmitted to; nuclear-polyhedrosis virus of, harmless to mammals, 536; *Beauveria rileyi* isolated from, and *Aspergillus flavus* isolated from eggs of, in U.S.A., 537; environmental control of mating in, in California, 538; parasitised by DD-136 (nematode), 541; isolation, identification, and synthesis of sex attractant of, 647
- Trichoplusia oxygramma*, on field crops in Alabama, 498
- Trichopoda pennipes*, introduction and release of, against *Nezara viridula smaragdula* in Hawaii, 173
- Trichopoda pilipes*, introduction and release of, against *Nezara viridula smaragdula* in Hawaii, 173
- Trichopria*, *Bonnetia comta* parasitised by, in China, 220
- Trichothecium roseum*, development of stored-product insects on, 236
- Trichlistus podagricus*, parasitic in larvae of *Enarmonia ratzeburgiana* in Quebec, 349
- a,a,a*-Trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine, and insecticides, effect of, on cotton seedlings, 596
- Trifluralin (see *a,a,a*-Trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine)
- Trifolium alexandrinum*, *Sitona* spp. on, in Israel, 447; overwintering and transmission of phyllody virus to, by *Euscelis plebeja*, 578
- Trifolium hybridum*, *Hypera* spp. on, in Soviet Union, 143; pests of, in Soviet Union, 552
- Trifolium incarnatum*, virus of, infecting vector; *Agallia constricta* on, in New York, 70; phyllody and leaf chlorosis of, transmitted by *Euscelis* and *Macrosteles* spp. in Britain, 232; *Rachiplusia ou* on, in Alabama, 498; overwintering and transmission of phyllody virus to, by *Euscelis plebeja*, 578
- Trifolium medium*, *Therioaphis subalba* on, 308
- Trifolium pratense*, *Hardya anatica* on, in Yugoslavia, 136; *Hypera* spp. on, in Soviet Union, 143; use of *Bombus* spp. for pollination of, 184; *Therioaphis luteola* on, 308; pollination of, by bumblebees and honeybees in Britain, 523; *Sitona* spp. damaging, in Soviet Union, 550; pests of, in Soviet Union, 552; witches'-broom virus disease of, in Holland, 568; overwintering and transmission of phyllody virus to, by *Euscelis plebeja*, 578
- Trifolium repens*, *Miccotrogus picirostris* on, in U.S.A., 29; *Hypera* spp. on, in Soviet Union, 143; clover yellow vein virus of, in Britain, 336; Collembola in relation to injurious fungi on, in Holland, 383; witches'-broom virus disease of, in Holland, 568; overwintering and transmission of phyllody virus to, by *Euscelis plebeja*, 578
- Triglochin maritima*, *Aphis triglochis* in relation to, in Britain and Holland, 653
- Trimethure, use of, in traps for *Ceratitis capitata*, 53; combined with trichlorphon in traps for *Ceratitis rosa* and *C. capitata*, 130; attraction of starved males and females of *Ceratitis capitata* to, 636
- Trimethoate (see Prothoate)
- O,O,O-Trimethyl Phosphorothioate, treatment of soil with, 28
- 3,4,5-Trimethylphenyl Methylcarbamate, toxicity of, to *Distantiella theobroma*, 72
- Trinervitermes geminatus*, distribution of, in Nigeria, 467
- Trinervitermes occidentalis*, distribution of, in Nigeria, 467
- Trinervitermes oeconomus*, distribution of, in Nigeria, 467
- Trinervitermes togoensis*, distribution of, in Nigeria, 467
- Trinervitermes trinervius*, distribution of, in Nigeria, 467
- Trinervitermes trinervoides*, inactivation of insecticides against, by various soil types in South Africa, 395
- Trinidad, *Rhynchophorus palmarum* in, 41, 70; *Selenothrips rubrocinctus* on cacao in, 74; *Aleurocanthus woglumi* not recorded in; *Rhynchophorus palmarum* in felled coconut stumps in, 172; *Entomoseius dysderci* in, 205
- Triops granarius*, damaging rice in Swaziland, 132
- Trioxys*, parasitising *Aphis fabae* in Poland, 97
- Trioxys angelicae*, parasitising *Toxoptera aurantii* in Italy, 103; parasitising aphids on apple in Holland, 121
- Triozia apicalis*, bionomics and control of, on carrot, 136
- Triops cancriformis*, attacking rice in Soviet Union, 140
- Triozia diospyri*, on persimmon in Florida, 543-545
- Triozia erythrae*, *Citrus* virus in relation to, in South Africa, 396
- Triozia magnoliae*, on *Magnolia virginiana* and *Persea* spp., in Florida, 543-545
- Triozia tremblayi*, insecticide control of, infesting onion in Italy, 627
- Triozia tripunctata*, control measures against, on blackberry in Florida, 649
- Triphenyl Phosphate, as synergist, effect of, on insecticides against *Dermestes* spp., 254
- Trisodium Phosphate, use of, for removing insecticide deposits from contaminated cages, 276
- Trithion (see Carbophenothion)



- Triticum aestivum*, inheritance of reaction to *Cephus cinctus* and stem solidness in crosses of, in Alberta, 535
- Triticum monococcum*, not attacked by *Haplo-diplosis equestris* in Germany, 380
- Triticum persicum fuliginosum*, resistance of, to *Lema melanopa*, 582
- Tritium, Radioactive, insecticides labelled with, 27
- Tritoneptis klugii*, parasitising *Neodiprion sertifer* on pine in Czechoslovakia, 200; parasitising *Pristiphora abietina* on spruce in Germany, 566
- Triton B-1956, and BHC, 86; in insecticide sprays against *Liriomyza munda*, 208
- Triton X 100, in insecticide sprays against *Liriomyza munda*, 208; and sodium hypochlorite, against pathogens of *Anthonomus grandis*, 363
- Trochilium apiforme*, on poplar in Spain, 128; infesting poplar in Soviet Union, 193
- Troctes*, attacking eggs of *Lasioderma serri-corne* in India, 399
- Trogoderma glabrum*, mating competitiveness of  $\gamma$ -irradiated males of, 280; sex pheromones in females of, 487; high-frequency electrical fields for control of, in stored wheat, 490; effect of  $\gamma$ -radiation on, 588
- Trogoderma granarium*, effects of gaseous tensions on mortality of larvae of, 4; in Israel, infesting stored wheat, question of cannibalism by, 5; on stored groundnuts in Nigeria, 110; suitability of climatic areas for infestation of, in stored wheat in Canada, 156; effect of temperature on susceptibility of, to pyrethrins, 218; neem-seed powder as protectant against, in stored grain in India, 259; insecticides and fumigants against, infesting oil-seed cakes from the Sudan, 333; infesting processed food bari in storage in India, 399; *Amphibolus venator* preying on, in stored wheat and barley in India, 476; in stored wheat in Iran, 519; factors affecting phototactic responses of, 601
- Trogoderma inclusum*, laser effects on, 23; effects of different surfaces on toxicity of insecticides against, 353; sex pheromones in females of, 487
- Trogoderma versicolor*, infesting stored dates and figs in Israel, 143
- Tropaeolum majus*, witches'-broom virus disease of, in Holland, 568
- Tropaeolum minus*, insects on, 160
- Tropidocephala saccharivorella*, on sugar-cane in India, 480
- Tropidocephala signata*, on sugar-cane in India, 480
- Tropinota squalida*, bionomics and control of, in vineyards in Sicily, 610
- Trout, dieldrin residues in, 80
- Tyrophagus putrescentiae*, transmission of *Beauveria bassiana* by, to *Galleria mellonella* in Czechoslovakia, 345
- Trypodendron lineatum*, flight and attack of, in relation to felling date of logs, on *Pseudotsuga menziesii* in British Columbia, 22; in relation to *Perniphora robusta*, 98; mycangia in, 310; *Beauveria bassiana* for control of, in Czechoslovakia, 428; reactions of, to light and humidity, 571; response of, to female produced pheromone on Douglas fir in Oregon, 656
- Tryporryza incertulas*, *Isotima javensis* parasitising, on rice in India, 219; in Asia, biological control of, in Philippines, 481; insecticide against, on rice in Philippines, 615
- Tryporryza innotata*, in Asia, biological control of, in Philippines, 481
- Tryptophan, in diets for *Tribolium*, 78; in diets for *Tribolium* spp., 503
- Tsuga heterophylla*, *Lambdina fiscellaria lugubrosa* on, in Oregon, 42
- Tubercularia*, Collembola in relation to, on clover and grass in Holland, 383
- Tuberculariella*, species of, from *Platyphloeus wilsoni* in British Columbia, 310
- Tunisia, *Oxycarenus hyalinipennis* in, 243; secondary food plants of *Ceratitis capitata* in; factors limiting infestation of *Citrus* by *Ceratitis capitata* in; bitter orange as source of *Ceratitis capitata* in, 244; *Phoracantha semipunctata* damaging *Eucalyptus* spp. in, 245; notes on secondary pests in; Collembola injuring lucerne in, 393; *Euzophera osseatella* in, 611
- Turkey, *Kermania pistaciella* on *Pistacia vera* in, 10; *Tetranychus cinnabarinus* on cotton in; *Phoracantha semipunctata* on *Eucalyptus* in; *Brachycolus noxius* on cereals in; *Eriophyes pyri* on pear in, 83; catalogue of aphid of, 179; migration of *Aelia* and *Eurygaster* in, 233; natural food-plant of *Phrydiuchus* sp. in, 273; *Anarsia lineatella* and *Cydias molesta* in, 333; *Ips tridentatus* on cedar in, 380; survey of stored-product pests and their control in, 614
- Turnip, varietal resistance to insect attack in Wisconsin, 275; damage to, by *Nysius huttoni* in New Zealand, 313; *Pieris brassicae* on, in India, 318; adhesives used in seed coating reducing germination in, 344; persistence of dimethoate on, and aphids on, in U.S.A., 363; effect of systemic insecticide on, against *Phyllotreta pusilla*, in Texas, 414; varietal resistance of, to *Phyllotreta striolata* in North Carolina, 524
- Turpentine, Chlorinated, alone and with BHC aerosols of, against *Leptinotarsa decemlineata*, 514
- Turpentine Tree (see *Pistachia terebinthus*)
- Tychius flavus*, bionomics of, and insecticide against, on lucerne in Rumania, 91
- Tydeus*, control of, on *Citrus* in Portugal, 386; sprays against, on vines in Soviet Union, 509
- Tydeus zempoalensis*, bionomics of, on apple in Chile, as predator of other mites in Chile, 48
- Tylomyza pinguis*, evaluating damage by, to chicory in the forcing bed in Belgium, 575
- Typhaea stercorea*, attacking stored sunflower seeds in Yugoslavia, 602
- Typhlocyba rosae*, bionomics and control of, in Bulgaria, 197
- Typhlodromus*, predacious on other mites in Chile, 47; *Amblyseius* distinct from, 205; affected by chemical treatment of apple in Italy, 330; toxicity of carbaryl to, against *Tetranychus telarius*, 484

- Typhlodromus aberrans*, predacious on *Panonychus ulmi*, 121; effect on, of control measures against *Panonychus ulmi* on plum in Germany, 121
- Typhlodromus caudiglans*, abundance of, in apple plots treated with captan, 360
- Typhlodromus fallacis*, abundance of, in apple plots treated with captan, 360
- Typhlodromus occidentalis*, effects of artificial foods on reproduction and development of, 411; carbaryl harmful to, effectiveness of, against *Tetranychus telarius* in California, 579
- Typhlodromus pyri*, distribution of, on apple in Holland, predacious on *Panonychus ulmi*, 121; effect of spray schedule on population of, on apple in Holland, 122; effect of sprays against *Panonychus ulmi* on, in Britain, 470; effects of DDT and BHC on, on apple in Britain, 471
- Typhlodromus rickeri*, effects of artificial foods on reproduction and development of, 411
- Typhlodromus tiliarum*, predacious on *Panonychus ulmi*, 121; effect on, of control measures against *Panonychus ulmi* on plum in Germany, 121
- Tyrophagus longior*, effects of  $\gamma$ -radiation on, in Hungary, 324; factors affecting breeding rate of, 546
- Tyrophagus putrescentiae*, *Hypoaspis aculeifer* on, in Canada, 308; on *Albizia procera* in India, 663
- DL-Tyrosine, attractiveness of, to *Eurytoma roddi*, 57

## U

- UC 8305 (see P-Chloro-2,4-dioxa-5-methyl-P-thiono-3-phosphabicyclo[4.4.0]-decane)
- UC 10854 (see M-Isopropylphenyl Methylcarbamate)
- UC 19786 (see Dinobuton)
- UC 20047A (see 3-Chloro-6-cyano-2-norbornanone O-(Methylcarbamoyl)oxime)
- UC 21149 (see 2-Methyl-2-(methylthio)propionaldehyde O-(Methylcarbamoyl)oxime)
- Udumbaria nainiensis*, bionomics of, on fig in India, 478
- Uganda, control of groundnut rosette disease in, 133; advances in cotton pest control in, 442; termites as forestry pests in, 443; Lamiids attacking *Parinari excelsa holstii* in, 444; hand-operated machines for cotton pest control in, 625
- Ukraine, *Centistes lituratus* parasitising *Sitona* spp. in, 202
- Ulmus americana*, application of systemic insecticides to, against *Gossyparia spuria* in Virginia, 286
- Ulmus campestris*, *Scolytus scolytus* on, in Soviet Union, 142; chemical decomposition of, by termites, 406
- Ulmus laevis*, *Scolytus sulcifrons* on, in Soviet Union, 142
- Ulmus scabra*, *Scolytus scolytus* on, in Soviet Union, 142
- Ulobaris loricata*, on beet in Iran, 519
- Ultraviolet Light, in traps for Lepidoptera, 30, 41, 45; adaptation to, in *Heliothis zea*, 64; methylcarbamate insecticides decomposed by, 186; attracting *Nola distributa*, 265; as attractant for *Trichoplusia ni*, 283; in traps, 295; in traps for *Trichoplusia ni*, 492; in traps for *Manduca sexta*, 580; in traps for *Empoasca fabae*, 582; in traps for *Acrobasis vaccinii*, 583
- Unaspis citri*, sprays against, on *Citrus* in Florida, 207, 208; on *Citrus* in Florida, 543-545
- Unaspis yanonensis*, on *Citrus* in Japan, 548
- Unden (see Arprocarb)
- Unexan (see Chlordane)
- Union Carbide 8305 (see P-chloro-2,4-dioxa-5-methyl-P-thiono-3-phosphabicyclo [4.4.0] decane)
- Union Carbide 20047, 20047A (see 3-Chloro-6-cyano-2-norbornanone O-(Methylcarbamoyl)oxime)
- Union of Soviet Socialist Republics, *Locusta migratoria migratoria* in, 10; *Gastrolina thoracica* on *Juglans mandshurica* in, 11; flea-beetles on flax in; *Quadraspidiotus perniciosus* in, 12; pests of maize in, 13; *Leptinotarsa decemlineata* on potato in, 14; *Agrotis segetum* on sugar-beet, cotton, and tobacco in, 15; migration of *Schistocerca gregaria* to, 16; Carabids on cereals in; *Ostrinia nubilalis* on hemp in, 17; *Atragenus* spp. in; Sciarids infesting vegetables and mushrooms in, 55; bark-beetles on elm in; *Leptinotarsa decemlineata* on potato in; *Euproctis chrysorrhoea* in; *Lithocolletis blancardella* on apple in, 89; *Rhyacionia buoliana* on pine in; *Aegeria myopaeformis* on apple in, 90; *Filipjevimermis pologenzevi* parasitising *Melolontha hippocastani* in; forest pests in, 115; sexual maturation of *Locusta migratoria* in, 119; sawfly pests of conifers in; *Boarmia crepuscularia* infesting forests in; rice pests of, 140; Anthomyiids in, 141; *Muscina stabulans* parasitising *Leptinotarsa decemlineata* on potato in; *Archips crataeganus* on oak in; *Scolytus* spp. on elm in; adaptation of *Blastothrix confusa* to *Eulecanium corni* in, 142; *Eurygaster integriceps* on wheat in; *Hypera* spp. on clovers in; Longicorns infesting elm in, 143; *Lymantria dispar* in, 179; *Coleophora* spp. damaging larch in; *Asolcus* spp. parasitising *Eurygaster integriceps* and related Pentatomids in; *Bupalus piniarius* and its parasites on pine in, 189; *Argyresthia conjugella* on apple and *Sorbus aucuparia* in, 190; *Archips rosanus* on fruit trees in, 191; *Eumerus* spp. on onions in, 192; *Hapleginella laevifrons* infesting pine cones in; insect pests of poplar in, 193; *Hylemya antiqua* on onion in; Coleoptera damaging beet in; *Pegomya betae* on beet in, 194; *Lithocolletis pyrifoliella* damaging apples in; *Cleonus punctiventris* in; *Enarmonia formosana* on apple in; *Lobesia botrana* on vines in, 195; population dynamics of insects in; booklet of entomology and acarology in, 196; varietal resistance of wheat to *Hadena sordida* in, 293; virus of winter wheat transmitted by *Psammotettix alienus* in, 294; textbook of forest entomology



- in; *Tetranychus telarius* on cotton in, 319; *Tetranychus telarius* on beans in; *Pseudococcus comstocki* on mulberry in, 320; *Aphis fabae* on sugar-beet in; *Sitona* spp. attacking pea seedlings in; damage to wheat grains by *Eurygaster integriceps* in, 321; *Prospaltella perniciosi* bred for release against *Quadraspidiotus perniciosus* on squash in; *Agria mamillata pacifica* predacious on *Hyponomeuta* larvae in; *Stenodiplosis bromicola* on *Bromus* spp. in, 322; *Oscinella frit* infesting maize in; beetles injurious to lucerne in, 323; *Mordellistena pumila* on lucerne in, 324; biological control of plant pests in, 427; commercial testing of bacterial preparation against pests of crops and plants in, 430; control of cabbage pests in; combined use of entomogenous bacteria and insecticide against *Leptinotarsa decemlineata* in, 432; reproduction in *Locusta migratoria* in; *Schistocerca gregaria* in, 433; effects of temperature on diapause in Lepidoptera in; effects of freezing temperature on populations of *Euproctis chrysorrhoea* and *Lymantria dispar* in, 434; review of Aphelinids in; Conopids causing myiasis of honey bees in; *Megastigmus strobilobius* infesting fir cones in; effect of day-length and temperature on development of *Pieris napi* and *Pieris rapae* in, 437; Aphidiine parasites of aphids in, 455; aphids associated with trees in; parasites of injurious forest insects in; *Quadraspidiotus perniciosus* on apple in, 508; resistance of apple to *Eriosoma lanigerum* in; sprays against mites on vines in; *Cydia pomonella* pupating in soil in apple orchards in, 509; *Lygus rugulipennis* destroying eggs of *Leptinotarsa decemlineata* in; methyl bromide fumigation of fruits infested by *Hyphantria cunea* in; pests of ornamental plants in, 510; outbreak of *Lethrus jacobsoni* on vines in; control of *Hylemya* spp. on cabbage in, 511; *Varroa jacobsoni* on honey bees in, 534; work on Bombyliids in; *Dendroctonus micans* infesting roots of spruce in; *Eurygaster integriceps* on wheat in, 549; *Sitona* spp., damaging leguminous crops in, 550; *Pegomya betae* and *Aphis fabae* damaging sugar-beet in, 551; chemical protection of cabbage from *Hylemya* spp. in, 552; *Pseudaletia unipuncta* in; *Phenacoccus mespili* on fruit trees in; *Pieris brassicae* on cabbage in; parasites and predators of *Hyponomeuta padellus malinellus* on apple in; *Argyresthia ephippella* on cherry in, 553; Aphidiine parasites of aphids in, 603; pests of maize in, 633; *Phylloxera vitifoliae* infesting vines in, 634; *Leptinotarsa decemlineata* damaging egg-plant in, 635
- United States of America, pests of strawberry in, 18; weevils attacking pine in, 20; *Lithocolletes* spp. on apple and *Prunus* in, 21; *Miccotrogus picirostris* on white clover in, natural enemies of *Thyridopterix ephemeraeformis* in, 29; *Graphognathus leucoloma fecundus* on rice and *Lolium* in, 32; bark-beetles transmitting oak wilt virus in, 33; natural enemies of *Neodiprion pratti* in, 34; *Ostrinia nubilalis* on corn in, *Contarinia sorghicola* on sorghum in, 35; *Hypera variabilis* on lucerne in, *Aphrophora saratogensis* on red pine in; insecticides against *Hylemya brassicae* in, 36; *Megachile rotundata* and lucerne in; honey bees and pollination of cantaloup melons in; natural enemies of *Psylla pyricola* in, 38; *Anthonomus grandis* on *Hibiscus syriacus* in, 40; insecticidal test against *Ips confusus* in, 41; *Heliothis* spp. damaging sesame in; flight-range studies of Hemiptera in; *Evagora milleri* on lodgepole pine in; *Lambdina fiscellaria* on western hemlock in, 42; *Malacosoma disstria* on *Populus tremuloides* in; *Frankliniella occidentalis* on cotton in, 43; pests of cones and seeds of Douglas fir in, 44; bees pollinating groundnuts in, insecticides against *Heliothis zea* in, 45; predacious Mirids on apple trees in; marking of *Anthonomus grandis* in, 46; *Lachnosterna bruneri* attacking mahogany and litchi in, 47; behaviour of Noctuid moths in, 61; *Aleurocybotus occidus* on grasses and sedges in; *Dioryctria* attacking pine-cones in; summer migration of *Hypera variabilis* in, 62; flight activity of *Hypera variabilis* in; *Euschistus conspersus* reared on bean pods in; dynamics of pink bollworm populations in, 63; *Heliothis zea* in, effects of sorghum varieties on *Sitophilus zeamais* in, 64; *Scolytus quadrispinosus* on *Carya* in, 65; resistance of cabbage varieties to attack by aphids and Noctuids in, 66, 67; *Hylastes annexens* in spruce in; *Murgantia histrionica* in, 67; *Sirex aerolatus* in, *Eurytoma tumoris* in, biology of *Aphrophora* spp. in, 68; *Melanophila consputa* on pine-trees in; *Mycodiplosis alternata* on *Cornus* in, 69; *Dalbulus maidis* on maize in; *Agallia constricta* on clover in, 70; *Trialeurodes vaporariorum* transmitting virus in, 71; *Pachysylla* on *Celtis* in, 115; leaf-mining insects on *Robinia pseudacacia* in, 116; *Ips* spp. in, 153; doubtful use of *Heterographis fulvobasella* against *Halogeton glomeratus* in, 164; spread of *Bathyplectes curculionis* in, 168; *Microlarinus* spp. introduced against *Tribulus terrestris* in, 170; *Archips griseus* on oak in; *Matsucoccus resinosa* on cut logs of *Pinus resinosa* in, 179; *Ips* spp. in, 205; *Tomicobia tibialis* parasitising *Ips* spp. in, 206; research in pesticides in, 247-249; pesticides in public water supplies in; air contamination in, 248; use of *Phrydiuchus* spp. for control of *Salvia aethiopis* in, 273; research on chemosterilants for, control of insect pests in, 296; insecticides in human milk and body fat in, 299; parasites of Scolytids in, 309; Group VI of *Ips* species in, 310; stored grain pests in; potato insects in, 343; *Zeadiatraea grandiosella* on maize in, 360; aphids on leafy vegetables in, 403; pest control in, 405;  $\gamma$ -radiation for sterilizing *Anthonomus grandis* in, 412; *Sitophilus oryzae* and *Sitophilus zeamais* on cereals in, 417; insecticide residues in milk and tissues of cattle in, 418; Cicadellidae collected from maize in; pesticide reference standards of Entomological Society of America in; control of *Conoderus falli* on potato in; new Braconid parasites of *Choristoneura fumifer-*

- ana* in, 463; holocyclic strain of *Therioaphis trifolii* on lucerne in, 493; *Macrosiphum pisum* parasitised by *Aphidius smithi* in, 501; tracer dyes for measuring aerial spray deposits in forests in, 524; *Smithiavirus pectinophorae* sp.n. isolated from *Pectinophora gossypiella* in, 536; parasites of *Heliothis* spp. in, 539; colour studies of *Ennomos subsignarius* in, 540; *Hylobius pales* and *Pachylobius picivorus* on pine in, 542; *Macrocheles boudreauxi* sp.n., associated with *Ips* and *Dendroctonus* spp. in, 571; *Dalbulus* spp. and *Graminella nigrifrons* as vectors of maize stunt virus in, 644
- Uracil, for reversing effects of antimetabolites in *Anthonomus grandis*, 277
- Urea, toxicity of, to *Psylla pyricola*, 643
- Uric Acid, labelled with  $^{14}\text{C}$ , in nitrogen metabolism of *Anthonomus grandis*, 645
- Urocetus*, introduction of *Stereum chaillottii* to living trees by, in Canada, 309
- Urocetus gigas*, records of, infesting textiles in Germany, 521
- Urtica dioica*, *Tetranychus cinnabarinus* on, in Lebanon, 337
- Uruguay, *Cyclocephala signaticollis* in, 47; *Diatraea saccharalis* on sugar-cane in, 212; *Actinote pellenea pellenea* damaging sunflower in, 287; pests and diseases of *Citrus* in, 376; estimating populations of grasshoppers in; *Contarinia* sp. on sorghum in; *Bryobia rubrioculus* on apple in, 640
- Utah, natural enemies of *Lygus* spp. on lucerne in, 583
- Utetheisa pulchella*, *Bacillus thuringiensis* against, 103

## V

- V-C 1-13, V-C 13 (see Dichlofenthion)
- V.H.F. Radio Waves (see Radio Waves)
- Vaccinium*, *Boarmia crepuscularia* on, in Soviet Union, 140
- Vagoiavirus melolonthae*, virus disease of *Melolontha melolontha*, 105
- Vamidothion, in sprays against *Zeuzera pyrina*, 227; in sprays against *Stigmella malella*, 228; in sprays against *Tetranychus telarius*, 232; against *Eriosoma lanigerum*, 532
- Vancomycin, effects of, on reproduction of *Myzus persicae*, 496
- Vanillic Acid, effects of, on termites, 406
- Vanillin, effects of, on termites, 406
- Vapona (see Dichlorvos)
- Varroa jacobsoni*, bionomics and control of, on honeybees in Soviet Union, 534
- Vegetables, pests of, in India, 316; aphids on, in Bulgaria, 328
- Velsicol 1-Bromochlordene (see 1-Bromo-4,5,6,7,8-hexachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene)
- Venezuela, *Colaspis* sp. on banana in, 47; *Mocis repanda* in, 212; mites on *Citrus* in, 287; *Peregrinus maidis* on maize in, 300; aphids on *Citrus* in, 301; food-plants of *Aphis gossypii* and *Myzus persicae* in, 343
- Ventocoris fischeri*, *Asolcus semistriatus* parasitising eggs of, in Soviet Union, 189
- Venturia inaequalis*, sprays against, not affecting *Typhlodromus pyri* on apple in Holland; fungicides against, not harmful to predacious mites and Hymenopterous parasites on fruit in Holland, 122; infestation and control of, on apple in Wisconsin, 279; on apple in Italy, 330
- Veralin 3, against *Aphis fabae*, 98
- Verania*, predacious on *Aphis sacchari* and *Aphis indosacchari* in India, 479
- Verbascum*, *Campylomma verbasci* on, in Canada and U.S.A., 46
- Vermiculite, as pupation medium for *Rhagoletis pomonella*, 162; as rearing medium for *Diatraea saccharalis*, 166
- Verticillium*, Collembola in relation to, on clover and grass in Holland, 383
- Verticillium lecanii*, suspensions of, against *Saissetia hemisphaerica* on coffee in Costa Rica, 242
- Vespa orientalis*, pheromones in, 620
- Vetch (see *Vicia cracca*, *Vicia sativa*)
- Vibrissina turrita*, parasitising *Pristiphora erichsonii* in Japan, 660
- Viburnum tinus*, *Aleurotrachelus jelinekii* on, in Soviet Union, 510
- Vicia*, effect of, on populations of *Oscinella frit*, 13; *Matsumuraes phaseoli* on, in China, 264; parasitism of *Megoura viciae* on, in Soviet Union, 455
- Vicia cracca*, *Centistes lituratus* parasitising *Sitona scissifrons* on, in Canada, 202
- Vicia faba* (see Beans, Broad)
- Vicia sativa*, *Sitona* spp. on, in Israel, 612
- Victoria*, virosis-like proliferation of lucerne caused by *Aceria medicaginis* in, 223; *Chortoicetes terminifera* in, 266; *Didymuria violescens* on *Eucalyptus* in, 396; distribution of *Perga affinis affinis* in, 403
- Vietnam, *Anonaepestis bengalella* on *Annona squamosa* in, 73; review of diseases and pests of economic plants in, 462
- Vigna unguiculata*, aphids and virus diseases of, 26; in tests of effect of electrostatic dusting, 44; infected by virus disease of artichokes, 107; *Elasmopalpus lignosellus* on, 169; *Elasmopalpus lignosellus* on, in Georgia, 206; *Liriomyza munda* on, in Florida, 208; *Callosobruchus chitensis* on, in India, 215; *Elasmopalpus lignosellus* on, in Georgia, 579; pests of, in Nigeria, 605
- Vigna unguiculata sesquipedalis*, *Callosobruchus maculatus* on, in China, 264
- Villa sinuosa*, parasitising *Neodiprion pratti pratti* in Virginia, 34
- Vine, Grape, *Nipaecoccus vastator* on, in India, 86; *Lobesia botrana* and *Paralobesia viteana* on, in Israel, 135; *Vitacea polistiformis* on, in Missouri, 160; *Lobesia botrana* on, in Soviet Union, 195; *Eulecanium coryli* on, in Ontario, 203; damaged by *Melanogryllus desertus* in France, 227; determination of aldrin residues in; tainting of, by pesticides, 240; *Clausenia josefi* sp.n. parasitising *Planococcus* sp. on, in Israel, 257; *Lobesia botrana* on, in Bulgaria, 327; pests of, in Germany, 337; *Nabiseius duplicisetus* sp.n. on, in Chile,



- 343; *Argyrotaenia velutinana* on, 358; *Deltoccephalus glaucus* on, in Chile, 378; *Phylloxera vitifoliae* damaging resistant and susceptible hybrid varieties of, in France, 457; *Scaphoideus littoralis* as vector of golden-flavescence virus in France, 458, 459; insecticide residues on, *Tetranychus telarius* on, in Rumania, 461; sprays against mites on, in Soviet Union, 509; *Lethrus jacobsoni* on, in Soviet Union, 511; *Carneocephala flaviceps* and virus disease of, in Florida, 543-545; predacious mites of *Tetranychus pacificus* and *Eotetranychus willamettei* on, in California, 579; *Tropinota squalida* and *Epicometis hirta* on, in Sicily, 610; infested by *Phylloxera vitifoliae* in Soviet Union, 634
- Vine, Puncture (see *Tribulus terrestris*)
- Vinsonia stellifera*, in Florida, 543-545
- Violets, infested by *Dasyneura affinis* in Britain, 650
- Virginia, *Thyridopteryx ephemeraeformis* on *Robinia pseudacacia* in, parasites of *Itopectis conquisitor* in, 29; *Neodiprion pratti* and its natural enemies on *Pinus virginiana* in, 34; *Gossyparia spuria* on *Ulmus americana* in, 286; control of *Lasioderma serricorne* in tobacco warehouses in, 354; control of *Ephestia elutella* in stored tobacco in, 355; aphids on vegetables in, 363; *Panonychus ulmi* on apple in, 369; control of *Hypera variabilis* on lucerne in, 497; control of *Aegeria pictipes* on peach in, 590
- Virginia-Carolina 3-676 (see O-Methyl S,S-Dipropyl Phosphorodithioate)
- Viruses or Virus Diseases (of insects), in *Lymantria dispar*, 7; in *Agrotis segetum*, 16; susceptibility of *Lambdina* spp. to, 18; in *Malacosoma*, 43; susceptibility of races of *Pieris brassicae* to, 48; in Lepidoptera, factors affecting virulence of, question of pathogenicity of, to mammals, 49; effects of infection by, on habits of insects, 50; adhesion of preparations of, to pine foliage, effects of, on adult Lepidoptera, 56; in Coleoptera, 105; in *Adoxophyes orana* and *Mamestra brassicae*, 122; in *Malacosoma neustria*, 123; in *Panonychus citri*, 167; in *Pseudaletia unipuncta*, 175; in *Galleria mellonella*, 226; control of insects by, 240; in *Neodiprion sertifer*, field use of, 339; in control of Noctuids, 361; susceptibility of larvae of *Malacosoma disstria* to, 371; field use of, against *Lymantria dispar*; in *Pseudaletia unipuncta* and *Colias eurytheme*, 373; method for demonstration of, in *Neodiprion sertifer*, 384; electron microscope observations of, from *Malacosoma neustria*, 403; production, identification, and standardization of, for use against insects, 425; host range of; electron microscopy of, in *Hyphantria cunea*; in *Agrotis segetum* and *Hadena sordida*; increased virulence of, in successive generations of *Galleria mellonella*; mass production of; in *Zeiraphera diniana*; effect of ecological factors on; infecting Lepidopterous defoliators of *Quercus ilex*; latency in; development of, in *Galleria mellonella*; transovarian transmission of, 431, 432; use of, in biological control of forest pests; use of, in control of *Neodiprion sertifer*; in *Lymantria dispar*, 432; in *Pseudaletia separata* and *Heliothis assulta*, 439; infecting *Operophtera brumata*, 502; in *Pieris brassicae*, 506; electron micrographs of membranes from, 526; transmitted by *Rachiplusia ou*, 535; in *Oryctes rhinoceros*; in *Pectinophora gossypiella*; of *Trichoplusia ni* harmless to mammals, 536; in *Rhopalosiphum maidis*; laboratory tests with, in *Heliothis zea*, 537; factors affecting susceptibility of insects to; RNA changes in insect tissue infected with; in *Bombyx mori*; light microscopy of virogenic stromata of cytopolyhedra of; staining method for inclusion bodies of, 572; *Bacillus thuringiensis* delaying death of larvae of *Malacosoma neustria* infected with, 573; infecting *Ecpantheria icasia*, 645
- Viruses or Virus Diseases (of plants), relation of aphids to, 26; transmission of, by *Psylla pyricola*, 55; feeding habits of *Piesma quadratum* in relation to transmission of, 59; relation of *Toxoptera citricida* to, 60; in vector specificity tests, 69; transmitted by *Dalbulus maidis*; transmitted by *Agallia constricta*, *A. constricta* inspected by, 70; aphids not transmitting beet pseudo-yellows virus, transmitted by *Trialeurodes vaporariorum*, 71; in tests of aphid vectors of, 84; transmitted by Hemiptera, 87; transmitted by aphids; causing degeneration of artichoke, 106; measures against aphid vector of, 118; transmitted by aphids, 130; graft, aphid and mechanical transmission of, 133, 134; insect vectors of; factors affecting outbreaks of, 184; transmitted by *Hyalesthes obsoletus*, 198; in India; transmitted by *Aphis gossypii*, 217; *Brevicoryne brassicae* and, 222; transmitted by leafhoppers, 232; transmitted by *Bemisia tabaci*, 237; transmitted by *Toxoptera citricida*, 263; transmitted by *Macrostelus fascifrons*, 285; transmitted by Aleyrodids; transmitted by Delphacids, 300; relation of aphids to, 317; transmitted by *Myzus persicae*, 324; transmitted by *Javesella pellucida* and *Laodelphax striatella*, 332; transmitted by *Myzus persicae*, 334; transmitted by aphids, 335; transmitted by *Anuraphis helichrysi*, 336; transmitted by *Aphis fabae* and *Myzus persicae*, 338; transmitted by aphids, 384; varietal susceptibility of plants to, 385; transmitted by aphids, 386, 388; insect transmission of, in relation to greening, 396; transmitted by *Bemisia tabaci*, 410; in Jamaica, 403; aphids in relation to, 446; 457; transmitted by *Scaphoideus littoralis*, 458; transmitted by aphids, 469; transmitted by *Cecidophyopsis ribis*, 470; transmitted by *Bemisia* sp., 480; transmitted by aphids, 492; transmitted by *Myzus persicae*, 95; transmitted by aphids, 505; integrated measures against, 507; transmitted by *Aphis fabae*, 516; aphids in relation to, 518; transmitted by *Cavariella aegopodii*, 533; effect of temperature on, transmitted by aphids, 534; transmitted by leafhoppers and by grafting through dodder, 568; transmitted by mealybugs, 572; transmitted by *Macrostelus fascifrons*; interrelationships between insects

and, 573; overwintering in plant and insect vector; transmitted by *Euscelis plebeja*, 578; artificially induced transmission of, by *Piesma quadratum*, 600; transmission of, by *Ferrisia virgata* and *Planococcoides njalensis*, 625; transmitted by aphids, 631; recorded aphid vectors not transmitting, in Israel, 636; transmitted by leafhoppers, 644; transmitted by *Piesma quadratum*, 657

*Vitacea polistiformis*, bionomics and natural enemies of, on vines in Missouri, 160

Vitamin A, effect of, on *Agria affinis*, 604, 621

Vitamin A Acid, effect of, on *Agria affinis*, 604

Vitamin B, requirements of, in larvae of *Tribolium castaneum*, 343

Vitamin B-12, attractiveness of, to *Eurytoma roddi*, 57

Vitamin D-2, attractiveness of, to *Eurytoma roddi*, 57

Vitamin E, effects of, on *Agria affinis*, 621

Vitamin P (see Rutin)

Vitamins, in diets for insects, 30, 34; in diet for *Ips calligraphus*, 209; in diet for *Tribolium* spp., 503

Volck Summer Oil, with thioquinox, in sprays against *Tetranychus cinnabarinus*, 337

## W

Walnut, Black (see *Juglans nigra*)

Walnut, Manchurian (see *Juglans mandshurica*)

Walnut, *Rhynchaenus fagi* on, in France, 53

*Eulecanium* spp. on, in Ontario, 204; *Nola distributa* on, in China, 265

WARF Antiresistant, as synergist, and DDT, against *Phthorimaea operculella*, 449; and DDT, against *Thrips tabaci*, 590; and DDT, resistance to, in *Rhagoletis pomonella*, 642

Washington, *Miccotrogus picirostris* on white clover in, 29; pests of *Pseudotsuga menziesii* in, 44; *Cinara* infesting seedlings of *Pseudotsuga menziesii* in, 152; *Thrips tabaci* and *Tetranychus telarius* on potato in, 167; *Salvia aethiopis* in, 273; *Psylla pyricola* on pear in, 282; Diptera associated with *Dendroctonus pseudotsugae* in, 310; *Limoniulus canus* on potato in, 366; *Cydia pomonella* in, 368; *Tetranychus telarius* on seedling fruit trees in, 484; control of *Pissodes sitchensis* on Sitka spruce in, 500; *Capitophorus fragaefolii* on strawberry in, 588; DDT residues in big game animals in, 641; *Psylla pyricola* on pear in, 643

Wasps, population studies of, 247; attacking hive bees in Rhodesia, 394; as pollinators, 525

Water, in rearing medium for *Spodoptera littoralis*, 104; used in extraction of *Melia azedarach*, 218; contamination of, by insecticides, 240, 248; cotton bud extracts made with, 281; transport of, in insects, 297; influence of temperature and humidity on loss of, in *Iridomyrmex detectus*, 344; effects of, on *Bacillus thuringiensis*, 430

Water, Hot, tolerance of vegetables to; treatments with, 180

Water-flea (see *Daphnia*)

Watermelon, pollination of, by honey bees, 296; *Acalymma vittatum* on, in Kansas, 343; Coccids on, in South Africa, 395; *Myzus persicae* and virus disease of, in Hawaii, 495

Wax, Chlorinated, BHC with, 442

Weeds, *Lissorhoptrus oryzophilus* on, in California, 161; *Deltocephalus glaucus* on, in Chile, 378; in relation to insect pests in orchards, 381; as source of beet viruses in Britain, aphids on, 384

Wepsyn (see Triamiphos)

Wesson's Salts, in diets for insects, 34

West Virginia, *Pseudopityophthorus* spp. on oak in, 33; *Bathyplectes curculionis* in, 168

Western White Pine (see *Pinus monticola*)

Wheat (see also *Triticum*)

Wheat, *Tanymecus dilaticollis* on, in Yugoslavia, 6; pests of, in Soviet Union, 17; uptake of dieldrin by, 19; wireworms on, in Britain, 80; pests of, in India, 86; *Melolontha melolontha* on, in China, 89; seed treatment of, against *Zabrus tenebrioides*, in Rumania, 90; winter harvest of, in relation to *Hyponomeuta padellus malinellus*, 98; *Haplodiplosis equestris* on, in Germany, 100; cultural practices in relation to infestation of; *Hylemya coarctata* on, in France, 105; aphids and virus diseases of, in New Zealand; *Rhopalosiphum padi* on, in New Zealand, 118; *Hardya anatolica* on, in Yugoslavia, 136; *Eurygaster integriceps* on, in Soviet Union, 143; *Eurygaster integriceps* on, in West Pakistan, 144, 145; early harvesting of, not practicable for control of *Eurygaster integriceps* on, in West Pakistan, 145; *Nezara viridula* on, in Japan, 151; interrelations of damage to, and feeding by *Agrotis orthogonia* in Alberta, 153; *Aceria tulipae* on, in Arkansas, 159; *Mayetiella destructor* on hybrid varieties of, in Illinois, 163; *Athesapeuta cyperi* developing on, in Hawaii, 175; injuriousness of *Chlorops pumilionis* to, in Bulgaria, 197; bioassay of dieldrin residues in, 202; damaged by *Tanymecus indicus* in India, 214; *Agriphila straminea* on, in Britain, 231; *Eleodes* spp. on, in South Dakota, 270; varietal resistance of, to *Hadena sordida* in Soviet Union, 293; virus of winter varieties of, transmitted by *Psammotettix alienus* in Soviet Union; *Hylemya coarctata* on, in Germany, 294; *Lema melanopa* on, in Indiana, 307; *Rhopalosiphum fitchii* and *Rhopalosiphum padi* reared on, in Manitoba, 311; damage caused by *Chlorochroa sayi* to, in Canada, 312; pests of, in India, 316; aphid transmission of mosaic virus disease to, in India, 317; protection of, from pests in Soviet Union, 319; damage caused by *Eurygaster integriceps* on, in Soviet Union, 321; thrips on, in Holland, 341; Auchenorrhyncha and Heteroptera on, in Sweden, 345; *Conoderus* sp. and *Lachnosterna cribrata* on, in Texas, 364; *Haplodiplosis equestris* on, in Germany, 380; *Hylemya coarctata* on, in Britain, 386; *Sitophilus* spp. in relation to, in U.S.A., 417; *Sitodiplosis mosellana* on, in British Columbia, 422; *Petrobia latens* on, in Queensland, 449; re-



- sistance of varieties of, to *Mayetiola destructor* and *Toxoptera graminum* in Kansas, 496; pests of, in Iran, 519; absorption of systemic insecticides by roots of, 532; early cutting of, as measure against *Cephus cinctus* in Alberta, 534; *Cryptolestes ferrugineus* on fungi-infected seeds of, 540; effect of feeding by *Toxoptera graminum* on roots of, in Texas, 541; population dynamics of *Eurygaster integriceps* on, in Soviet Union, 549; damaged by *Eurygaster* and *Aelia* spp., in Bulgaria, 554; *Haplodiplosis equestris* on, in Germany, 565; resistance to *Lema melanopa* in, in Michigan, 582; *Agrotis orthogonia* on, in Alberta, 590; transmission of barley yellow-dwarf virus to, by aphids, 631; outbreak of *Apamea basilinea* on, in Mongolia, 634
- Wheat (Stored), Coleoptera in, 3; treatment of, 4; *Trogoderma granarium* on, in Israel, 5; in diet for *Plodia interpunctella*, 34; development of *Sitophilus granarius* grains of, 39; insecticide residues in, 41; equipment for checking fumigation of, 55; Coleoptera in, 76, 77; consumption of, by *Sitophilus granarius*; detecting insects in, 79; effects of, on metabolism of insecticides, 114; effect of particle size of, on control of *Tribolium castaneum* by Malathion, 146; suitability of climatic areas for infestation of grain insects in, in Canada, 156; protection of, against *Tribolium confusum* and *Sitophilus granarius*, 161; sorption of fumigant gases by, 186; *Cheyletus eruditus* preying on stored-grain mites in, in Czechoslovakia, 200; control of pests of, 225; treatment of, in Australia, 238; susceptibility to  $\gamma$ -radiation in *Sitophilus granarius* in, 250; accelerated electrons and  $^{60}\text{Co}$  gamma radiation against *Sitophilus granarius* in, 252, 253; neem-seed powder as protectant against Coleoptera in, in India, 259; treatments for, against pests in Georgia, 364; pests of, in Portugal, 387; fumigation of, against pests in India, 399; *Bacillus thuringiensis* in treatment of, 430; measures of insect control in, in India, 463; factors affecting development of *Acarus siro* in, 466; *Amphibolus venator* preying on *Trogoderma granarium* in, in India; BHC treatment of, against *Ephestia* spp., weevils and other insect pests in India, 476; daylight reducing infestation of, by *Ephestia* sp. in India, 477; relationships of insects to hot spots in, 489; high-frequency electrical fields controlling insects in, 490; *Aeroglyphus robustus* in, in Canada, 495; chlorbicyclen treatment of, against *Sitophilus granarius*, 514; pests of, in Iran, 519; fumigation of, against pests in Kansas, 542; metabolism of bromophos in, 600; effects of temperature rise and oxygen depletion on insect survival in, 601; interrelation of fungi and insects to deterioration in, 623; treatment of, against *Lema melanopa*, 641, 642
- Wheat Bran, in diets for Lepidoptera, 87
- Wheat Embryo, in diets for insects, 23
- Wheat Flakes, chloropicrin residues in, after chamber fumigations, 375
- Wheat Flour (see also Flour)
- Wheat Flour, insects reared on, 50; in diets for *Tribolium*, 78; in diet for *Hylemya brassicae*, 154; *Tribolium castaneum* in, in India, 215; *Latheticus oryzae* reared on, 254; productivity and development of *Tribolium* spp. on, 503; in diet for *Tribolium* spp., 602
- Wheat Germ, in diets for insects, 23, 34, 46; in diet for *Heliothis zea*, 170; in diet for *Hypera variabilis*, 285; survival of *Heliothis zea* and *Heliothis virescens* on, in Kentucky, 413; in diet for *Aeroglyphus robustus*, 495 in diet for *Lymantria dispar*, 538
- Whitewash, persistence of insecticide deposits on, on tile, 622
- Willow (see also *Salix*)
- Willow, *Stilpnolia salicis* on, in Czechoslovakia, 8; translocation of oxydemeton-methyl in, 27; *Aphis farinosa* on, in Italy, 103; *Eulecanium* spp. reared on, in Ontario, 203; *Melasoma* spp. on, in Florida, 543-545
- Wind, mortality of *Schistocerca gregaria* due to, 146; effect of, on flight of *Oscinella frit*; effect of, on flight direction at migration of *Aelia* and *Eurygaster* spp., 233; effect of, on dispersal of *Adelges piceae*, 485; effects of, on *Mayetiola destructor*, 487
- Windbreak, effects of, on aerial density of insects and spiders, 335; outbreak of *Stilpnolia salicis* in, in Austria, 521
- Winthemia, parasitising *Pseudaletia unipuncta* in Ontario, 350
- Wireworms, insecticides against, on wheat in Britain, 80; treatments against in Rumania, 90; alternatives to organochlorine insecticides against, in potatoes in Britain, 386; insecticides against, damaging maize in Soviet Union, 633
- Wisconsin, *Eucosma monitorana* on *Pinus resinosa* in, natural enemies of insects in, 46; *Scolytus quadrispinosus* on hickory in, 65; pests of cabbage in, 66, 67; effect of *Bacillus thuringiensis* on arthropod fauna of apple orchard in, 167; insect injury to sour cherries in, 270; resistance to insect attack in crucifers in, 275; apple pests in, 279; *Neodiprion rugifrons* and *Neodiprion dubiosus* on *Pinus banksiana* in; *Empoasca fabae* in; *Empoasca fabae* on lucerne in, 307; integrated control of apple pests in, 360; *Bacillus thuringiensis* in, termites in; *Strongwellsea castrans* infesting *Hylemya cilicrura* in, 371; *Diabrotica longicornis* on maize in, 486; *Aspergillus flavus* in, *Trichoplusia ni* in, 537; local flight habits of *Empoasca fabae* on lucerne in, 582; systemic insecticides against *Diprion similis* on pine in, 588; *Neodiprion rugifrons* on *Pinus banksiana* in, 647
- Wofatox (see Methyl-parathion)
- Wood (see Timber)
- Woodpeckers (see *Dendrocopos* and *Centurus*)
- Wool, mothproofing of, 185; digestion of, by larvae of *Hofmannophila pseudospretella*, 522
- Woollen fabrics, treatments of, against *Anthrenus* and *Attagenus*, 33; pests on treated and untreated samples of, 125; method of testing proofness of, against *Tineola bisselliella* and *Attagenus piceus*, 240; pests of, in Germany, 521, 522

Wyoming, *Chaitophorus populellus* on *Populus* in, 26; control of *Pogonomyrmex occidentalis* in, 486; holocyclic strain of *Therioaphis trifolii* on lucerne in, 493

## X

*Xanthandrus*, mortality of, due to insecticide elimination of prey in Spain, 127

Xanthine, attractiveness of, to *Eurytoma roddi*, 57

*Xanthomicrogaster*, reclassification of, 55

Xanthophyll, repellent to *Eurytoma roddi*, 57; effect of, on *Agria affinis*, 604

*Xanthopimpla punctata*, *Nausinoe geometralis* parasitised by, in China, 221

*Xenochalepus dorsalis*, on *Robinia pseudacacia* in U.S.A., 116

*Xenoencyrtus niger*, introduction and release of, against *Nezara viridula smaragdula* in Hawaii, 173

*Xestobium plumbeum*, attacking deciduous trees in Poland, 324

*Xestobium rufosilvum*, attacking deciduous trees in Poland, 324

X-rays, use of, in studies of development of *Sitophilus granarius* within grains of wheat, 39; effects of, on development of sex cells in *Lema melanopa*, 65; use of, in tests of susceptibility of stored sorghum to attack by *Sitophilus oryzae*, 73; use of, in detection of pests in stored products, 118; effect of, on *Dacus tryoni*, 298; sterilizing effects of, on *Hypera variabilis*, 355; effects of, on susceptibility of *Tribolium* spp. to *Bacillus thuringiensis*, 431; use of, to detect mortality of *Melanophila californica* in pine bark, 596

*Xyla bakeri*, rearing and occurrence of, on pine in Florida, 308

*Xyla julii*, infesting pine in Soviet Union, 140

*Xyla minor*, rearing and occurrence of, on pine in Florida, 308

*Xyla pini*, rearing and occurrence of, on pine in Florida, 308

*Xylastodoris luteolus*, on royal palm in Florida, 543-545

*Xyleborus* (see also *Xylosandrus*)

*Xyleborus confusus* (see *Xyleborus ferrugineus*)

*Xyleborus ferrugineus*, associated with cacao in Costa Rica, 375

*Xyleborus fornicatus*, flight and dispersal of, in Ceylon, 235; side-effects of dieldrin sprays against, on tea in India, 397; tests with dieldrin in control of, on tea in Ceylon, 441; population dynamics and control of, on tea in Ceylon, 446

*Xyleborus monographus*, bionomics, distribution, food-plants and natural enemies of, on oak in Germany, 336

*Xyleborus perforans*, occurrence of, in Java, 238

*Xyleborus salvini*, associated with cacao in Costa Rica, 375

*Xyleborus sanguinicollis*, associated with cacao in Costa Rica, 375

*Xyleborus sharpi*, associated with cacao in Costa Rica, 375

*Xyleborus similis*, occurrence of, in Java, 238

*Xylena exoleta*, on beet in Tunisia, 393

Xylene, pyrethrum formulated in, 81

*Xyleutes*, wood-boring species of, in Indo-Malayan region, 178

*Xyleutes strix*, on *Sesbania grandiflora*, 178

*Xylodrepa quadripunctata*, predacious on *Gastrolina thoracica* in Soviet Union, 11

Xyloryctid, attacking *Hakea sericea* in New South Wales, 314

*Xylosandrus compactus*, growth and development of, reared on sterilized tea plants, 149; bionomics and control of, on coffee in India, 615

*Xylosandrus germanus*, growth and development of, reared on sterilized tea plants, 149; spore storage organ of, parthenogenesis of, in relation to *germanus* ambrosia fungus, 149-150; chromosome numbers and sex determination of, on tea in Japan, 547; conditions favouring attack on oak by, in Germany, 563

D-Xylose, attractiveness of, to *Eurytoma roddi*, 57

*Xyloterinus politus*, associated with Dutch elm disease in Quebec, 502

## Y

Yams (see also *Dioscorea*)

Yams, tolerance of, to methyl bromide fumigation and hot water treatments, 180; bromide residues from methyl bromide fumigations of, 419

Yeast, in diet for *Ceratitis capitata*, 51; in diet for *Dacus oleae*, 52; in diets for *Tribolium*, 78; in rearing medium for *Spodoptera littoralis*, 104; in diet for *Hylemya brassicae*, 154; in diet for *Ips calligraphus*, 209; effect of, on development of *Ceratitis capitata*, 244; in diet for *Latheticus oryzae*, 254; in diet for *Diatraea saccharalis*, 268; in diet for *Diabrotica undecimpunctata undecimpunctata*, 285; attractiveness of, to insects, 352; in diets for *Ceratitis capitata*, 375; effectiveness of, in rearing medium for *Medetera aldrichii*, 412; in diet for *Anthrenus flavipes*, 441; in diets for *Hylemya brassicae*, 489; in diet for *Aeroglyphus robustus*, 495; in diet for *Tribolium* spp., 503; in diet for *Tyrophagus longior* and *Carpoglyphus lactis*, 546; in diet for *Tribolium* spp., 602

Yeast Filtrate, woollen fabric baited with, damaged by *Acheta domesticus*, 125

Yeast Hydrolysate, in diets for insects, 45; in diets for *Ceratitis capitata*, 409; effect of, in diet for Phytoseiid mites, 411; in diet for *Hylemya brassicae*, 489; feeding on, affecting attractiveness of trimedlure to *Ceratitis capitata*, 636

Yellow, attractiveness of, to *Toxoptera citricida*, 338

Yemen, *Schistocerca gregaria* in, 51

Yucca Flour, in larval diet of *Ceratitis capitata*, 376

Yugoslavia, *Oberea oculata* on basket willows in; *Tanymecus dilaticollis* on cereals and



sugar-beet in, 6; *Hyponomeuta padellus malinellus* in; *Lymantria dispar* on forest and fruit trees in; *Anastatus disparis* parasitising eggs of *L. dispar* in, 7; *Hardya anatolica* on wheat in, 136; *Phyllocoptruta oleivora* on *Citrus* in; *Neurotoma flaviventris* on cherry in, 257; *Anarsia lineatella* and *Cydia molesta* in, 333; *Pectinophora gossypiella* on cotton in; *Hyponomeuta padellus malinellus* on apple in; *Melolontha melolontha* in; *Telenomus terebrans* parasitising eggs of *Malacosoma neustria* on apple in, 392; virus of *Hyphantria cunea* in, 431; *Coraebeus rubi* and *Agrilus aurichalceus* on raspberry in, 569; insects attacking stored sunflower seeds in, 602; *Euzophera osseatella* in, 611  
Yukon Territory, distribution and hosts of  
*Pissodes schwarzi* and *Pissodes curriei* in, 423

## Z

*Zabrotes subfasciatus*, growth of, on beans of grafted *Phaseolus* plants, 150; water content of, in Japan, 548  
*Zabrus morio*, on cereals in Soviet Union, 17  
*Zabrus spinipes*, on cereals in Soviet Union, 17  
*Zabrus tenebrioides*, on cereals in Soviet Union, 17; on wheat in Rumania, 90; factors affecting efficiency of insecticides against, on cereals in Rumania, 461  
Zambia, cotton spraying equipment in, 441; annotated list of plant pests, diseases and fungi in, 620  
*Zeadiatraea grandiosella*, method of rearing, 34; birds as predators of overwintering larvae of, in maize stalks in Arkansas, 302; distribution of, on maize in U.S.A., 360  
Zectran, effects of humidity on persistence of, 46; toxicity of, to *Spodoptera littoralis*, 84; synthesis of, labelled with  $^{14}\text{C}$ ; activity of, against *Spodoptera eridania* and *Epilachna varivestis*, 186; guide to, 189; in sprays against cotton pests, 215; in sprays, against *Cydia pomonella*, 227; in sprays, against Lepidopterous larvae, 348; in sprays, against *Argyrotaenia velutinana*, persistence of, on grape foliage, 358; against Noctuids, 367; in sprays, effect of temperature on, against *Cotinis nitida*, 485; labelled with  $^{14}\text{C}$ , fate

of, in rats, 524; against *Aegeria pictipes*, 590; tests of, against *Phthorimaea operculella*, 613; in sprays against *Chilo suppressalis*, *Tryporyza incertulas* and *Sesamia inferens*, 615  
*Zeiraphera diniana*, granulosis virus attacking larvae of, 431; mass flights of, on larch in Austria, Switzerland and Italy, 520  
*Zeiraphera isertana*, preying on *Archips crataeganus* on oak in Czechoslovakia, 199  
*Zenillia vulgaris*, parasitising *Pieris rapae* in British Columbia, 594  
*Zeuzera*, wood-boring species of, in Indo-Malayan region, 178  
*Zeuzera indica*, on *Litsea chinensis* and *Cinnamomum*, 178  
*Zeuzera pyrina*, on apple in Italy, insecticides against, 5; insecticides against, on fruit trees in Malta, 135; control of, on apple in France, 227  
Zinc (as plant nutrient), effect of, on fecundity of *Tetranychus telarius*, 274  
Zinc Chloride, effects of, on deposits of DDT, 366  
Zineb, and other fungicides, in sprays against *Venturia inaequalis* not harming beneficial mites and insects, 122; and Ziram, in sprays against *Aculus pelekassi*, 331; and chlorobenzilate, in sprays against *Tetranychus cinnabarinus*, 337  
*Zinnia elegans*, infected by virus disease of artichokes, 107  
Zinophos (see Thionazin)  
Ziram, and other fungicides, in sprays against *Venturia inaequalis* not harming beneficial mites and insects, 122; and Zineb, in sprays against *Aculus pelekassi*, 331  
Zitan 85 (see Protein Hydrolysate)  
*Ziziphus jujuba*, attacked by *Porphyria parva* in China, 238  
*Ziziphus lotus*, *Ceratitis capitata* on, in Tunisia, 244  
*Ziziphus vulgaris*, *Ceratitis capitata* on, in Tunisia, 244  
*Zootermopsis angusticollis*, susceptibility of, to *Bacillus thuringiensis* in Wisconsin, 371  
*Zootermopsis nevadensis*, attractiveness of, of substances found in fungus-attacked wood, 406  
Zophosis, on maize in Rhodesia, 72  
*Zoysia matrella*, *Sphenophorus venatus vestitus* on, in Florida, 543-545





## NOTICES

---

The annual subscription, payable in advance, to the *Review of Applied Entomology* Series A (Agricultural) is £6.75 to subscribers in countries contributing to the Commonwealth Agricultural Bureaux and £13.50 to those in non-contributing countries, post free; Series B (Medical and Veterinary) £3.00 and £6.00, respectively.

Orders and subscriptions should be sent to the Director, Commonwealth Institute of Entomology, 56, Queen's Gate, London, S.W.7, or through a bookseller.

Complete sets of back volumes are available; for details and prices, please apply to: Central Sales Branch, Commonwealth Agricultural Bureaux, Farnham House, Farnham Royal, Slough SL2 3BN, England.

Secretaries of societies and editors of journals wishing to exchange their publications for those of the Institute are requested to communicate with the Director. Authors of papers on economic entomology, particularly those published in non-entomological journals, are invited to send reprints to the Director for notice in the *Review*.

The Executive Council of the Commonwealth Agricultural Bureaux is a signatory to the Fair Copying Declaration, details of which can be obtained from the Royal Society, 6, Carlton House Terrace, London, S.W.1.

The Commonwealth Agricultural Bureaux Organisation does not accept responsibility for any trade advertisements in this Journal.

